NetworkWorld

July 17, 2000

Volume 17, Number 29

THE Signature SERIES

You

All about your

Job
Salary
Future
Free time

ewspaper $5.00

007

Presenting The Indu
Desktop Manag

Web Management™

Backup/Disaster Recovery

Database Management

Monitoring

SERVER MANAGEMENT

Application Management

Network Management

Centralized Security Management

Single Sign-On™

Integrated Encryption

Firewall With Authentication

Virus Protection

SECURITY MANAGEMENT

Centralized User Administration

Malicious Web Content Detection

EnterpriseDiscovery™

Event Management/Correlation

Problem Management

Business Process Views™

ENTERPRISE MANAGEMENT

Predictive Management

Real World Interface™

Performance Management

Workload Management

OS/2

UNIX

Windows 98, 95, 3.1, CE

Windows NT

NetWare

EXTENSIVE PLATFORM COVERAGE

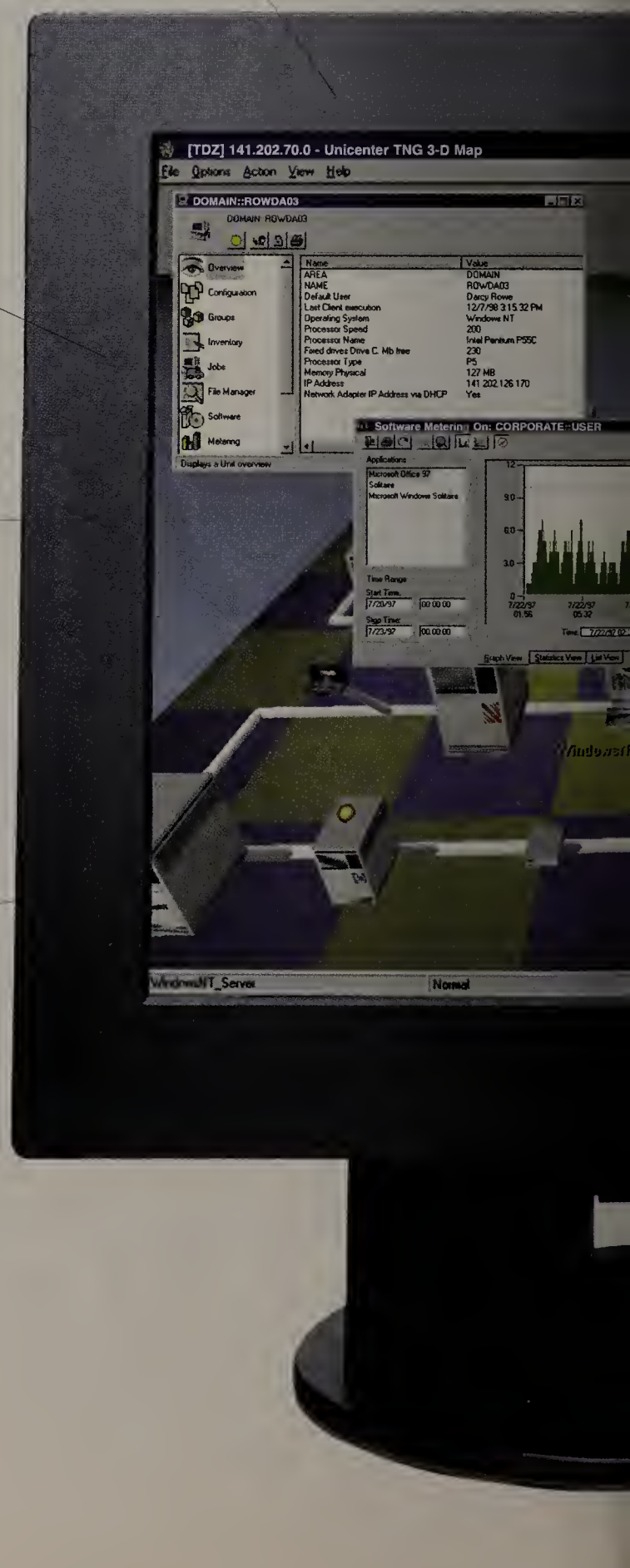
OS/390

OpenVMS

LANs, WANs, and Internet

TCP/IP, IPX, DECnet, SNA

AS400



COMPUTER ASSOCIATES®

Software superior by design.

©1999 Computer Associates International, Inc., Islandia, NY 11749. All product names referenced herein are trademarks of their respective companies.

stry's Only Complete ement Solution.

Session Recording

Multi-Processor Support

Stealth Viewing

Roving Call-Back

Multi-Host Viewing

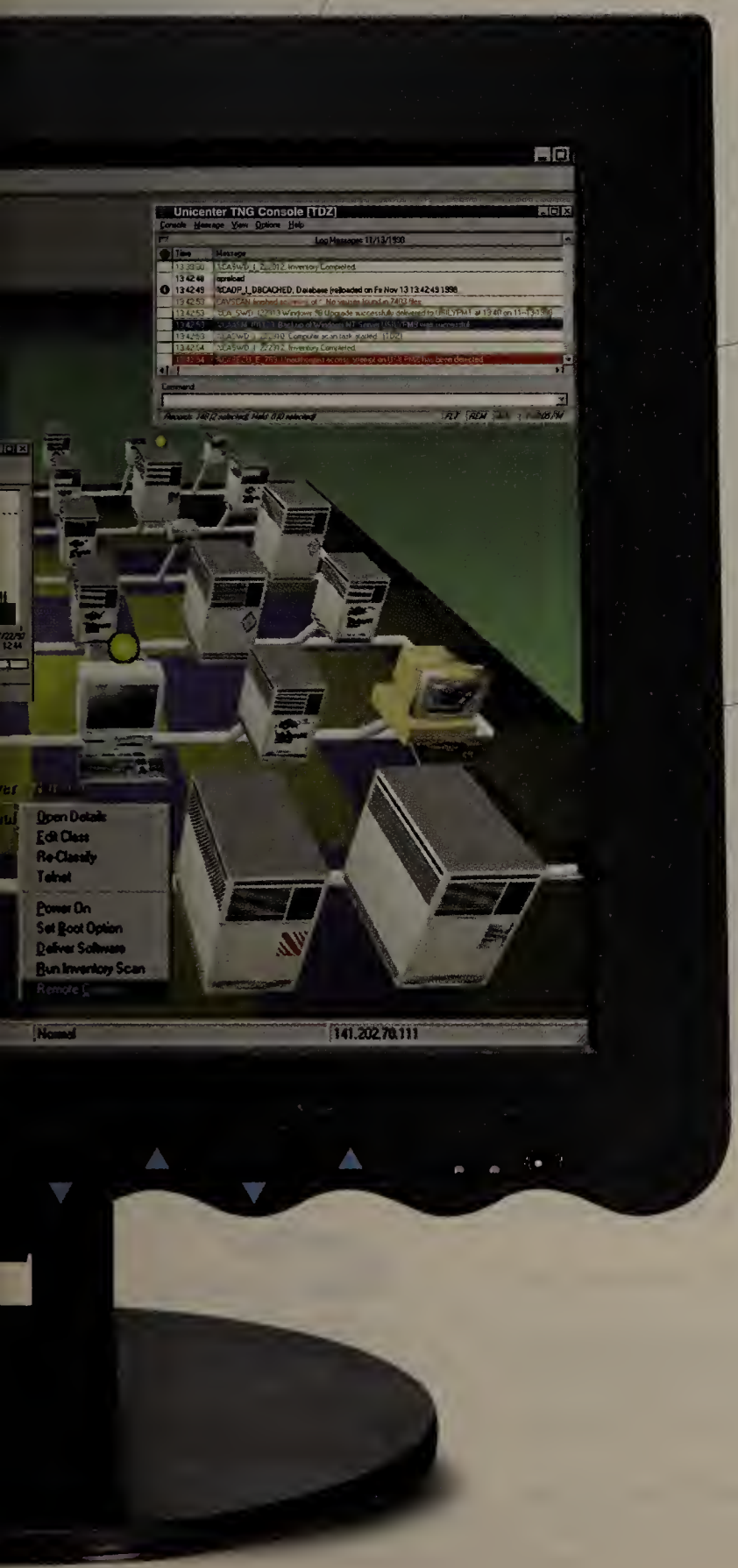
File-Transfer With Crash Recovery

Remote Access

REMOTE CONTROL

Integrated NT Security

Remote Reboot



Software Metering/Auditing

Software Maintenance

Software Inventory

Y2K Compliance Check

ASSET MANAGEMENT

Hardware Inventory

Configuration Management

Financial Tracking

Policy-Based Management

Historic Analysis

Roaming Users Support

Hands-Free OS Installation

SOFTWARE DISTRIBUTION

Broadcasting

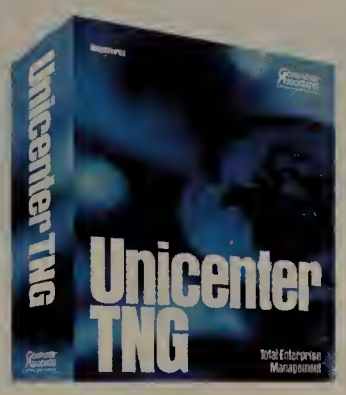
Event Monitoring And Automation

Secure Data Transport System

Dynamic Groups

Push/Pull

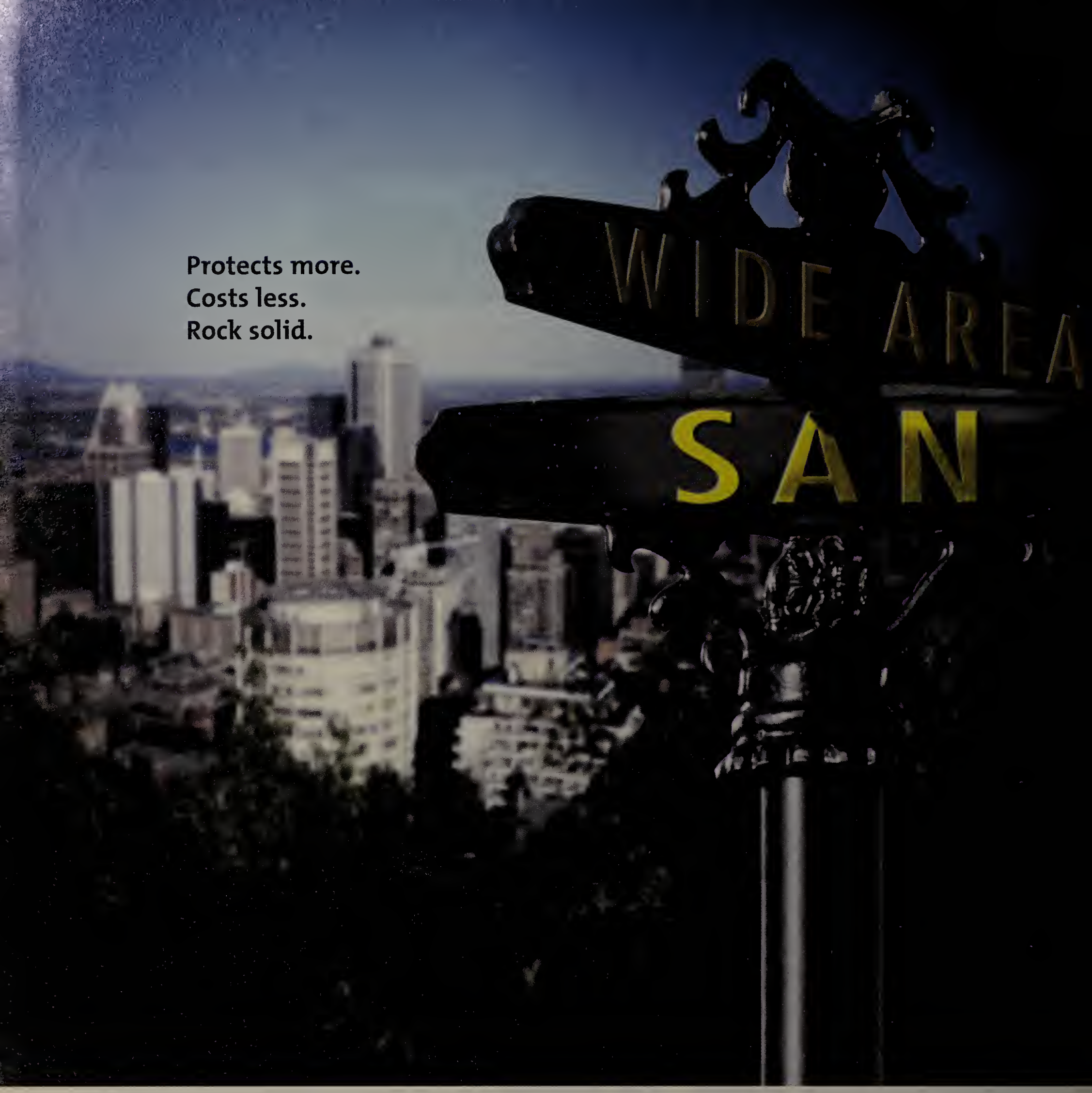
N-Tiered Distribution



Yes, all of these features and functions can be found in one solution: And you can find out more by making one phone call. Call today and find out how the industry standard for network and systems management can help you get all of your desktops under control.

For more information, call 1-888-UNICENTER, or visit www.cai.com/ads/desktopmgmt

Unicenter TNG®



Where Wide Area and SAN converge, you'll find the 7100 ATM Storage Router. Imagine a storage solution that simplifies the protection and management of data. A solution that gives you the ability to distribute yet manage storage from a central location. A solution that supports storage locally off-site, insuring total data recovery in case of site failure. Now imagine it costs less than traditional solutions. Call 1-800-643-7148 or visit www.crossroads.com to learn more about the 7100 ATM Storage Router and how it can empower your business.

CROSSROADS

www.crossroads.com

©2000 Crossroads Systems, Inc. All rights reserved.

NetworkWorld

JULY 17, 2000

Page 9

9 Vendors to spruce up **56K modems.**

9 **Women** and **minorities** could help fill worker shortage.

10 **Cisco** and **Oracle** teaming up on customer relationship management centers.

12 Microsoft begins filling in **.Net** blanks.

12 The deal is dead, so what's next for **WorldCom** and **Sprint?**

14 **Oracle** claims $1 billion worth of savings from using its products internally.

18 **Military** outlines e-business battle plan.

20 New head of **Internet Architecture Board** speaks out.

119 **PeopleSoft** debuts Web-enabled ERP suite.

120 **Sphere** device extends convergence beyond headquarters to remote locations.

120 **Intel** gear to improve bandwidth management.

Page 20

Infrastructure

23 **3Com** boosts wireless LAN security.

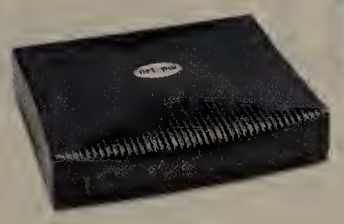
23 Start-up **Pirus** building storage network 'uber-switch.'

26 **IBM, Microsoft** and **Intel** team on super cluster.

26 **Nortel** spinoff delivers gigabit copper wares.

30 **Dave Kearns:** Message returned: I am on vacation.

Carriers & ISPs



Page 33

33 **Genuity** bolsters service guarantees.

33 **Netopia** bonds DSL lines for faster connections.

34 **David Rohde:** AT&T's circuit-switching dilemma.

Enterprise Applications

35 **Software** from Worldweb.net manages Web content.

35 Microsoft set to release **NetWare** integration tools.

36 **Review:** Adding biometric authentication to NetWare.

38 Latest version of **IBM DB2** targets big e-comm customers with better integration, content management and business intelligence.

38 **Scott Bradner:** Don't write off all the dot-coms.

Page 41

Technology Update

39 **Gigabit Ethernet** is MAN's best friend.

40 **Gearhead:** The elephant remembers to remember audio.

Management

41 **To train or not to train:** Keeping employees up to date on technologies could keep them at your company for the long-term. In fact, a *Network World* survey shows that workers value training above other benefits.

Editorial: Trying hard to put access in every pot. **Page 42.**

Daniel Blum: Don't get lost in Active Directory forests. **Page 43.**

Thomas Nolle: Will licensing issues kill Internet video? **Page 43.**

Backspin: The secret and scary success of skins. **Page 122.**

'Net Buzz: Wringing profits out of idle PCs is no easy task. **Page 122.**

Net Know-It-All ..... Page 14

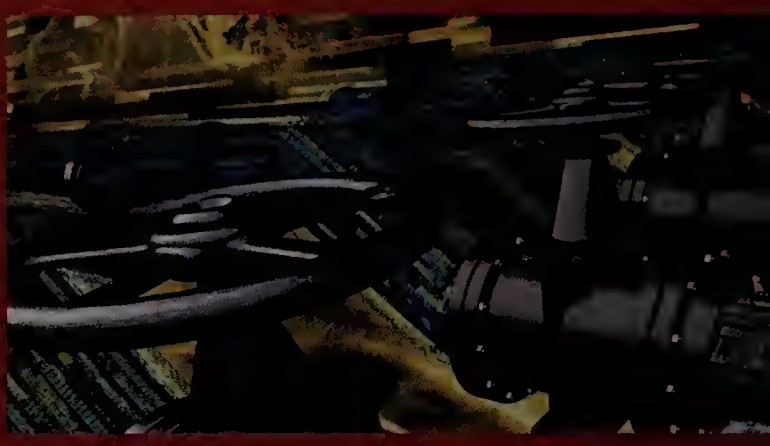
Ask Dr. Intranet ..... Page 39

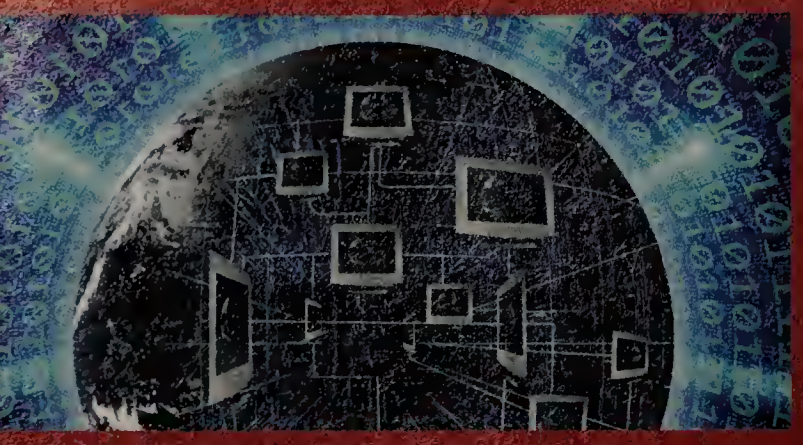
Message Queue ..... Page 42

Editorial and advertiser indexes ..... Page 118

CONTACT US Network World, 118 Turnpike Road, Southborough, MA 01772; **Phone:** (508) 460-3333; **Fax:** (508) 490-6438; E-mail: nwnews@nww.com;
CIRCULATION: Phone: (508) 490-6444; Fax: (508) 490-6400; E-mail: nwcirc@nww.com; **STAFF:** See the masthead on page 18 for more contact information. **REPRINTS:** (717) 399-1900

POWER





SPEED

SECURITY

INDUSTRIAL STRENGTH INTERNET

In today's Internet economy, success depends on the quality of your Internet infrastructure. Globix Internet Data Centers and high-speed network are engineered to deliver all of the reliable power, performance and physical security you need – and much more.

Globix facilities are powered by an uninterrupted supply of clean, regulated electrical current. We build to n+1 redundancy with two distinct power feeds into our facilities, dual UPS systems and dual power lines available to cabinets and cages. We speed your customers to your Web site. Globix operates its own ATM fiber-optic backbone, connecting major cities throughout the United States and Europe with more than 900 active peering agreements for maximum throughput and performance.

We provide security and environmental protection for your Internet business 24 x 7 x 365. Professional security guards, ID key cards, biometric scanners and closed-circuit cameras combine with redundant Liebert AC systems and fire-suppression systems to make sure your equipment is protected at all times.

So, before you invite millions of customers to your e-business, or launch your mission-critical Internet applications, call us for a free consultation. Or call to arrange a tour of one of our state-of-the-art Internet Data Centers and see the Globix difference for yourself.

GLOBIX™

The Global Internet Exchange

1-800-4-GLOBIX, ext.1429 • www.globix.com

Co-Location • Web Hosting • Dedicated Access • Streaming Media • E-Commerce • Internet Security

"Globix" and the stylized "G" logo are trademarks of Globix Corporation. © Copyright 2000 Globix Corporation. All Rights Reserved. NASDAQ: GBIX

THIS WEEK ONLINE

NetworkWorldFusion
www.nwfusion.com

INTERACTIVE

Test Pilots

Our reader review program is gaining steam. Find out what your peers are saying about these products:

- **GyroPoint's Gyromouse Presenter.**
- **Hewlett-Packard's Jornada 690.**
- **Digital Persona's U. Are U.**
- **Matsucom's Onhand PC**
- **Multi-Tech's MVP-200 2-port Gateway and the MVP-800 8-port Gateway.**
- **Intel's InBusiness Internet Station 56K, Version 1.0.38.**
- **3Com's Palm V with OS 3.1.**

Do you have a product that deserves roasting or boasting? Log on to Test Pilots, and submit your review. Simply answer a few questions, including what you like or dislike about the product, advice for your peers about rolling it out and what needs to be improved. The more reviews you submit, the more prizes you'll receive, from a balsa airplane to a set of aviator glasses. You'll also be entered to win a Test Pilot bomber jacket.
DocFinder: 8635

The You Issue

Read all about your job, salary and future in our annual You Issue, starting on page 45. Then head online for more with our extensive You minisite.

- **Salary calculator.** Find out what your peers are making and what kind of raises you should expect. Simply plug in your title, region and a few more demographics, and we'll tell you what salary range you should be in. **DocFinder: 9023**
- **Career quiz.** Put your career choice to the test with our quick quiz. Our special personality test will help you determine if you're in the right line of work. **DocFinder: 9026.**
- **Life before networking.** Face it, not everyone knew they wanted to be an IT manager when they grew up. Find out what wacky jobs your peers had before they became network gurus. **DocFinder: 9025**
- **Concerning you.** There are some career and network issues that keep you up at night, according to our survey. Can you guess what they are? **DocFinder: 9021**
- **Peer party.** We've gathered some of your colleagues together to talk about their jobs and how the Web is affecting what they do. Find out what they have to say in our roundtable, complete with audio clips. **DocFinder: 9024**

COONEY'S CORNER

The best of the NetFlash daily newsletter

Lucent spinoff revamps messaging pricing

Lucent's enterprise spinoff has hit on a way to encourage the use of emerging applications such as unified messaging and speech recognition: include them free in voice mail systems. Avaya Communications has announced a new pricing model for its range of messaging servers, such as the Intuity Audix, and the Octel 250 and 350. **DocFinder: 9049**

AT&T, BT reveal their first global mobile services

AT&T Wireless Services and British Telecommunications Tuesday announced the launch of the first services from Advance, the strategic alliance between the two companies. **DocFinder: 9050**

WorldCom hit by 'Net problem

This hasn't been WorldCom's week. Along with the official termination of the company's planned merger with Sprint announced Thursday, all has not been well with MAE-West, one of the ISP's facilities that acts as a major network access point on the Internet. **DocFinder: 9051**

Napster users create legal gray area for employers

Alan Rhea, IS director at U.S. Diamond Wheel, doesn't want his end users installing Napster software on their computers. Its file-sharing technology poses a security risk, and personal use of work computers violates company policy. **DocFinder: 9052**

— Michael Cooney, associate news editor

Sign up for this e-mail newsletter online. DocFinder: 3850

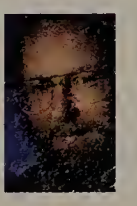
COLUMNISTS

View from The Edge

An 'Ecosystem' needs an edge, too

AT&T has thrown its hat in the intelligent Web content distribution ring. But The Edge Managing Editor David Rohde tells you why Akamai and Digital Island are eating the carrier's lunch. **DocFinder: 9042**

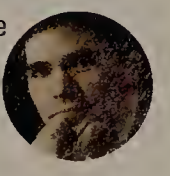
Compendium



Round mouse punch

Fusion Executive Editor Adam Gaffin tells you why readers are up in arms over little round mice.
DocFinder: 9043

Keeping Current



Privacy for sale

As the spate of Chapter 11 filings from e-commerce upstarts continues, Fred McClimans wonders whether your privacy is on the auction block.
DocFinder: 9044

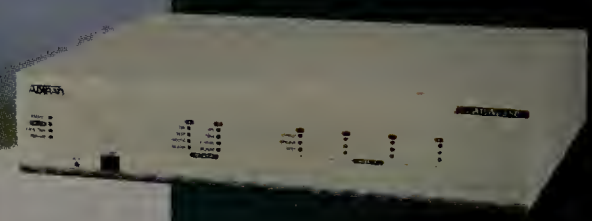
What is DocFinder?

We've made it easy to access articles and resources online. Simply enter the four-digit DocFinder number in the search box on the home page, and you'll jump directly to the requested info.

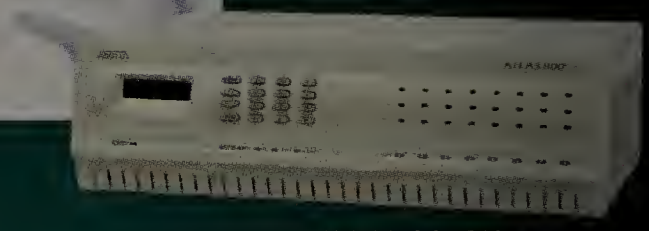
WAN CONNECTIVITY SOLUTIONS T3 T1 E1 INTEGRATED ACCESS FRAME RELAY DSL ISDN DDS WIRELESS

You need integrated access solutions that position your network for things to come.

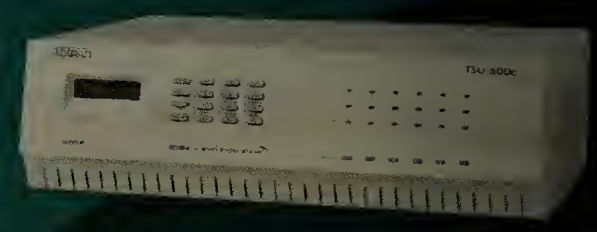
ADTRAN delivers.



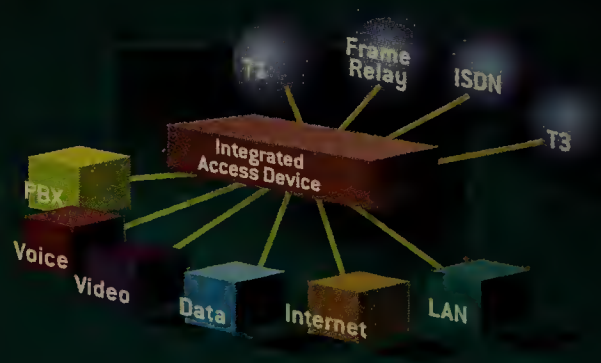
ATLAS 550 IAD
Supports multiple T1s over TDM or packet networks with migration path to ATM



ATLAS 800^{PLUS} IAD
Large-capacity IAD supports multiple T1s or T3 over TDM networks, or multiple T1s over packet networks



TSU 600e™ IAD
Supports single T1 installations with up to 24 remote sites



Scalable solutions for converged voice/data and TDM-to-ATM migration.

You know it's in your future. Converged voice and data, and packet technologies. Both promising **lower costs and greater performance**. Make it happen now with ADTRAN integrated access solutions. These **converged voice/data solutions** deliver optimum cost-efficiency and streamline network operations. They're scalable, so you invest only in what you need today, knowing you have the flexibility to accommodate **greater bandwidth and newer technologies** at a later time. With options for standard TDM voice, as well as voice over Frame Relay and voice compression, ADTRAN IADs make the transition to a converged network simple. It's no wonder we're already the market share leader in enterprise IADs. **It's our business.**

ADTRAN IADs make it possible to meet the demands of today's applications, while positioning your network for next-generation technologies.

To speak to a network engineer about implementing ADTRAN IAD solutions, please call **877 402-1383** (toll-free).
To register online for an IAD Buyers' Guide, visit *www.adtran.com/iadbuyer*.

ADTRAN also offers the Total Access™ line of integrated access devices for carriers.

Experts choose ADTRAN.™

ADTRAN

Spring 1999 Update: Wide Area Networks. Dataquest, May 31, 1999.

©2000 ADTRAN, Inc. All rights reserved. C1AD0007NWWD(C)
ADTRAN is a registered trademark of ADTRAN, Inc.

News

New modem standard boosts dial-up access options

V.92 proposal promises to save companies toll call cash and increase upload speeds.

BY TIM GREENE

A new modem standard called V.92 tweaks 56K bit/sec modems in ways that can save companies money, but might scare ISPs.

Modems deploying the proposed technology, which could be available by the end of the year, will feature faster setup times. This means direct-dial remote-access calls to companies will be shorter and, in the case of 800 and toll calls, cheaper. V.92 modems also boost upload speeds from 33.6K to 48K bit/sec and let users with call waiting put Internet modem connections on hold to take incoming phone calls.

Current 56K bit/sec modems had been touted in some circles as the end-all in analog modems, but developmental work since 1998 (when the current 56K bit/sec standard was approved) has wrung out more features. In addition, 56K bit/sec modems have proved wildly popular, with about 95 million in service worldwide, according to Amy Helland, an analyst with Cahners In-Stat Group in Phoenix. The new devices could be even more popular.

"The faster setup times alone will make upgrading to V.92 worthwhile for direct-dial remote access. Five to 15 seconds is a long time if you are paying for long-distance or 800 numbers and you get thousands of calls," says Ken Krechmer, technical editor of *Communications Standards Review* in Palo Alto, who sits on International Telecommunication Union modem committees.

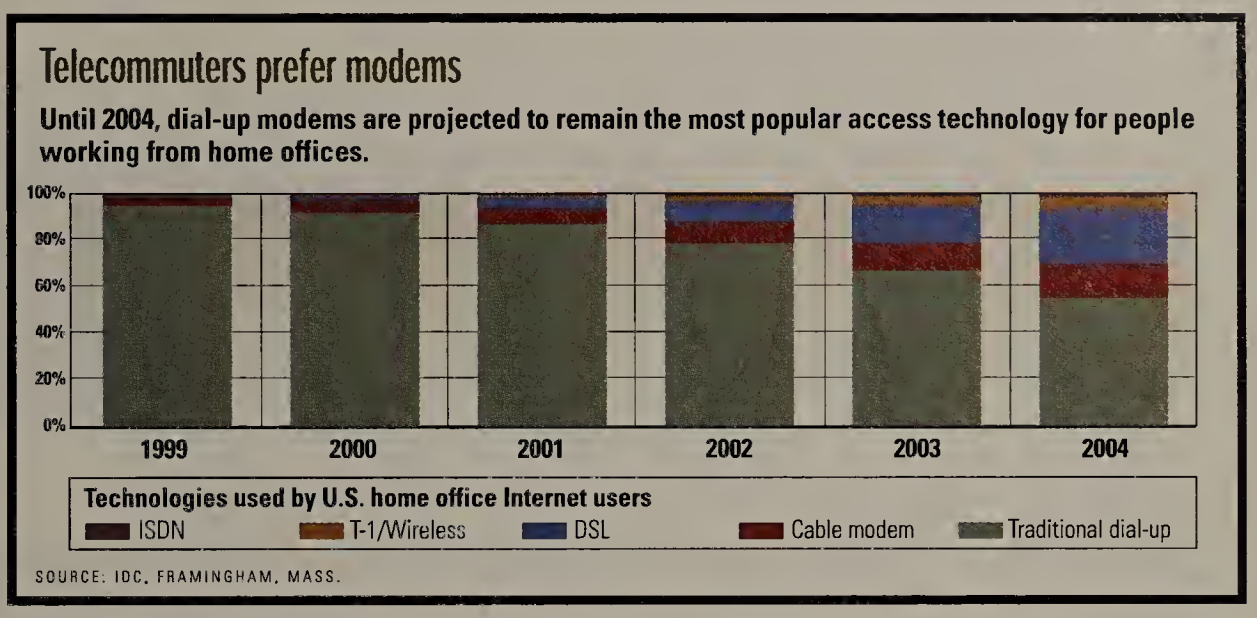
These modems will also send data faster from remote sites than 56K bit/sec modems do today, meaning remote dial users will get offline sooner, again promoting cost savings.

But ISPs might be reluctant to use these improved modems because they also let customers put an ISP's modem on hold while customers take phone calls on call waiting. That would promote longer calls from customers, resulting in either more busy signals when other customers try to connect or in ISPs installing more modems to keep the rate of busy signals low.

Average online dial-up times now range from 28 to 30 minutes, and the call-waiting feature would likely increase that, says Neil Harrington, manager of network operations for Sprint's technical services division, which sells modem pool services to ISPs. But Sprint's ISP customers have not focused on that potential drawback. They are aware of V.92 technology and crave its faster training times and greater upload speeds, Harrington says.

For end users, the call-waiting feature means they can log on to the Internet and, if they have call waiting, take an incoming call without having to break the Internet connection. The Internet call goes on hold for a set period of time, saving the user from

See **V.92**, page 119



Women, minorities could fill more high-tech jobs

BY SHARON GAUDIN

WASHINGTON, D.C. — A Congressional Commission presented the House Committee on Science last week with a roadmap of recommendations they say will solve the country's critical shortage of high-tech workers.

The way to solve the problem, according to the commission, is to draw more women, minorities and people with disabilities into the high-tech workforce. The group added that if IT attracted the same number of women as men, there would be no shortage of skilled high-tech workers.

And yet today that shortage is costing Silicon Valley companies $3 billion to $4 billion per year in lost production and has the potential of staggering the nation's economy and its position as a global technology leader.

"I see this as the greatest challenge we have as a nation," says Neal Lane, former director of the National Science Foundation and the current president of the White House Office of Science and Technology Policy. "We've seen this problem coming for years. We need to do something about it now. If the current trend persists, we, as a country, will fall short."

Congressional representatives, scientists and high-tech employers all testified that increasing the number and diversity of Americans joining the high-tech labor force is critical to continuing the boom in the industry, which is largely credited as the lifeblood of the U.S. economy.

The problem, many industry observers say, is that women — who comprise half the population — only fill a fraction of IT jobs (see graphic, page 16). And it's even worse for minorities. The Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development reports that today only 7% of science, engineering and technology jobs are filled by minorities.

Alan Greenspan, chairman of the Federal Reserve Bank, said last week that the U.S. needs to better prepare its workers for jobs in the high-tech industry.

"Every citizen must count for opportunities and must be counted for our nation's well-being," Greenspan said, speaking to a gathering of U.S. governors. "How well we prepare our resources in this area will show in how well-prepared we are as a country."

And according to a range of numbers, the American workforce is not being well prepared for high-tech jobs.

Approximately 550,000 IT jobs are vacant in the U.S. this year, and that number is expected to balloon to 800,000 by 2002 and one million by

See **Women**, page 16

"The number of women in computer science is continuing to decline. We have to make changes, or we're going to have some tough adjustments."

Catherine Didion, executive director, Association for Women in Science, Washington, D.C.

NEWS BRIEFS, JULY 17, 2000

FBI's 'Carnivore' sparks criticism

The FBI last week acknowledged it is using an Internet-based wire-tapping application nicknamed "Carnivore" that plugs in to an ISP's equipment to intercept e-mail communications from suspected criminals. Carnivore also devours huge amounts of e-mail from nonsuspects, which has sparked criticism from some camps. Not surprisingly, Carnivore earned a strong rebuke from the American Civil Liberties Union, which expressed its outrage in a letter to lawmakers on the House Judiciary Committee's Constitution subcommittee. ACLU lawyer Laura Murphy noted law enforcement is required to "minimize" its interception of nonincriminating communications of a target of a wiretap order. "But Carnivore does the opposite by sweeping in e-mails from innocent Internet users as well as the targeted suspect," Murphy said in her letter to Charles Canady (R-Fla.), chairman of the Constitution Subcommittee, and ranking member Melvin Watt (D-N.C.). The ACLU suggested that the subcommittee consider drafting legislation to protect the privacy rights of Internet users. ISP EarthLink has said it would not install Carnivore because it can disrupt its network. EarthLink also cited privacy concerns.

Departures continue at Novell

Beleaguered network giant Novell lost another executive last week with the resignation of Dave Shirk, who was appointed chief technology officer less than two month ago. Shirk formerly had been senior vice president of product management for Novell with responsibility for defining and overseeing the strategy for all Novell products. A number of product managers who worked for Shirk have also defected in recent months, including Paul Corriveau, Michael Simpson, Patrick Harr, Blair Thomas, Jeff Hughes and Sam DiStasio. Shirk is taking a position with e-business vendor Vignette of Austin, Texas. Pamela Mahoney, senior manager of public relations, is also leaving the company.

Cisco, ClickNet to collaborate

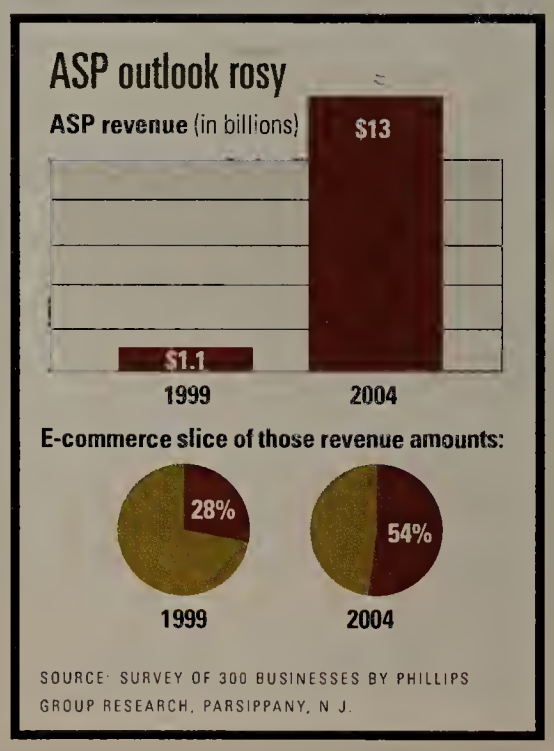
Cisco and ClickNet Software last week announced intentions to jointly develop an intrusion-detection system for e-businesses. The companies will combine ClickNet's entercept host-based intrusion-detection technology with Cisco's Secure Intrusion Detection System software. The software is designed to protect an organization's network perimeter and extranet, while entercept is intended to prevent intruders from exploiting security vulnerabilities in operating systems and applications. The companies did not disclose a time frame for releasing the product. They say they will finalize details of their relationship this fall.

Beep beep, beep beep, yeah!

The leadership of the Internet Engineering Task Force may have had a Beatles tune on its mind recently when it announced a new standardization effort with the nickname BEEP. The BEEP working group will develop the Blocks Extensible Exchange Protocol, which is essentially a tool kit that developers can use to quickly create protocols for a range of applications including instant messaging, file transfer, content syndication, network management and metadata exchange. BEEP will serve as an alternative to the aging HTTP for certain types of data exchange between systems. The BEEP working group will hold its first meeting in early August in Pittsburgh.

Survey sees ASP explosion

According to a new Phillips Group Research survey, the market for application service providers (ASP) will increase 12-fold by 2004, with demand for e-commerce applications providing the bulk of that growth. E-commerce apps are projected to account for slightly more than half of the total ASP pie by 2004, according to the survey. While only 4% of companies with between 500 and 100,000 employees are now using an ASP for e-commerce, the Phillips Group findings anticipate that number will exceed 70% in four years. To attract the largest enterprises to the service provider model, ASPs need to provide application-specific service-level agreements, the Phillips Group report says.



Cisco, Oracle to team on customer service centers

BY JIM DUFFY

SAN JOSE — Letting customers implement and operate IP-based virtual customer service centers is the intent of a joint development and marketing arrangement announced last week by Cisco and Oracle.

The companies are developing call center products that combine Oracle's customer relationship management (CRM) and enterprise resource planning applications with Cisco's multiple vendors. Moreover, these systems are based on proprietary network technology, including legacy telephony systems, whereas Cisco and Oracle are developing call center systems around the ubiquitous IP protocol. IP could potentially make these systems more adaptable and less costly to deploy and maintain, they say.

Users agree.

"What they're giving us is a system that will allow us to call routing and computer/telephony integration (CTI) software. The first product from this collaboration is expected by year-end.

Cisco and Oracle are attempting to develop and market products that will gradually supplant today's call center gear, which are cobbled together with disparate automated call distributors (ACD); PBXs; interactive voice response units (IVR); Web collaboration products; e-mail packages; and sales, service, marketing and e-commerce applications from plug and play across a standard medium," says Steve Roy, manager of integrated planning at Household Credit in Salinas, Calif. "We can build a CRM system [one] component at a time and work around those legacy systems that we can't root out of the environment. But this is going to give us a kick in the shorts to get it started."

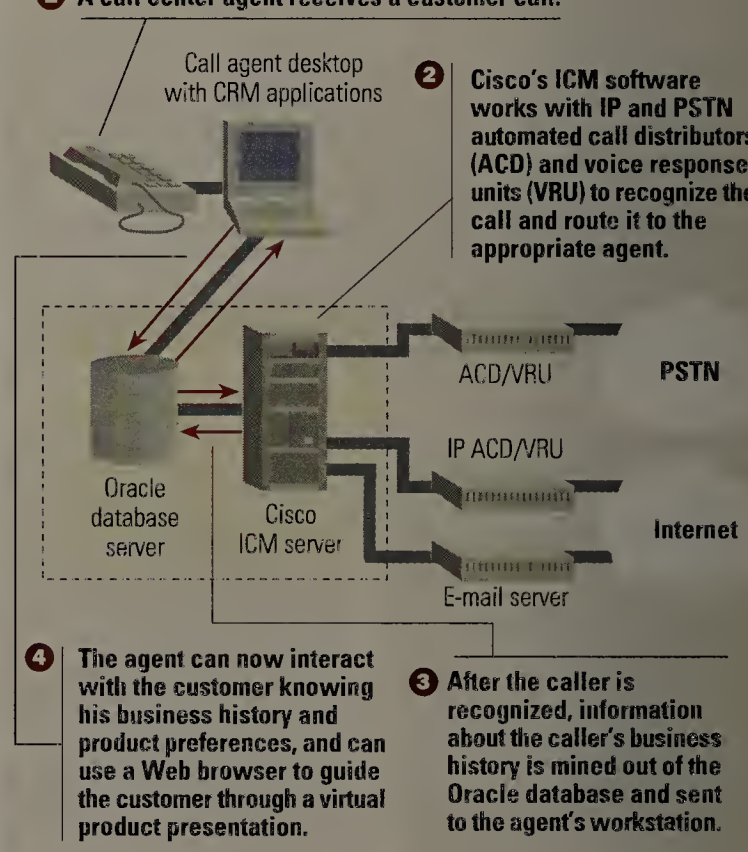
Cisco and Oracle say their effort will give the voice-over-IP market a similar kick.

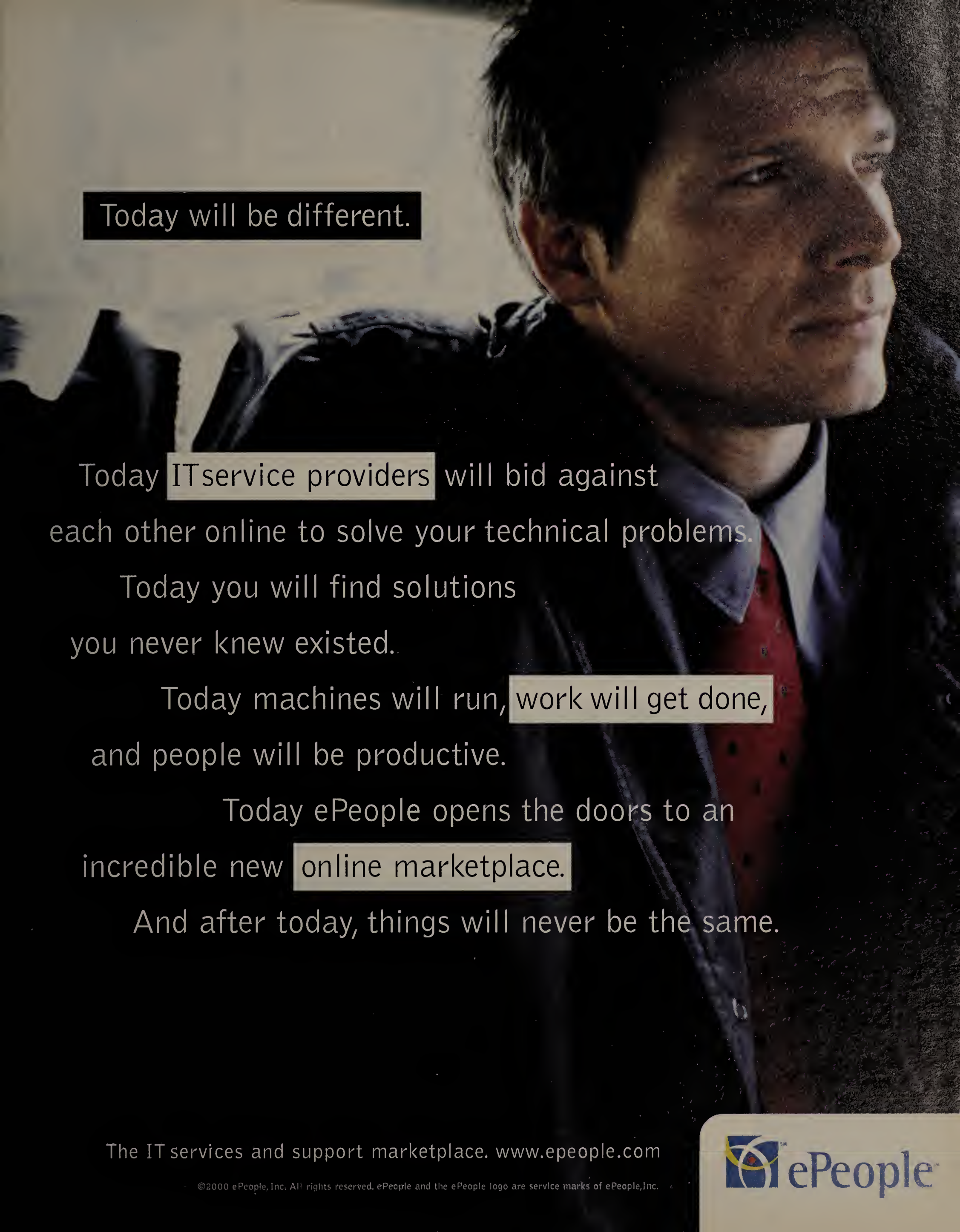
"The call center is one of the last bastions of strength for the

See **Team**, page 18

The collaborative call center

Cisco and Oracle's customer relationship management (CRM) solution:





©2000 ePeople, Inc. All rights reserved. ePeople and the ePeople logo are service marks of ePeople, Inc.

What lies ahead for WorldCom?

BY DENISE PAPPALARDO

It's back to an unclear drawing board for WorldCom and Sprint in the wake of their announcement last week that their troubled merger proposal is officially dead.

The boards of both companies were unwilling to wait until January to have their appeal heard countering the Department of Justice's suit that attempted to block the merger. And the companies were not willing to face the daunting possibility that the Federal Communications Commission and/or the European Commission might still reject the deal even if WorldCom and Sprint were to prevail in court.

Industry observers are not surprised by the deal's collapse, which for WorldCom and Sprint represents the culmination of a wasted nine months. WorldCom is still without a formidable wireless division and Sprint remains an attractive takeover target, says Brownlee Thomas, an analyst at Cambridge, Mass., consulting firm Giga Information Group.

WorldCom still has many options to bring a substantial wireless offering into its service portfolio, and few observers believe that Bernard Ebbers, president and CEO of WorldCom, will be shy about exploring them.

Ebbers also seems to believe the Justice Department has unfairly targeted WorldCom while continuing to approve local exchange carrier mergers. "The legacy of Janet Reno, Joel Klein and Bill Kennard will be the remonopolization of local services for consumers," he said at a New Orleans conference last week.

WorldCom comes out of this aborted deal with nothing gained or lost, Thomas says. Last year WorldCom negotiated with Nextel for a time, but walked away from that deal. Those talks could resume, or WorldCom may prefer to go after VoiceStream Wireless, one of many companies that has been rumored as a takeover target for German service provider Deutsche Telecom.

VoiceStream stands out as one of the more likely targets for WorldCom. Earlier this year VoiceStream merged with two of the better-known GSM communications wireless service providers, Omnipoint and Aerial. While today VoiceStream does not have a national footprint, its network covers 22 of the largest 25 markets and has 2.29 million customers.

But Giga's Thomas says WorldCom may not be done with Sprint. The firms could strike a deal through which WorldCom resells Sprint PCS wireless services to its customers or invests in the wireless division, she says.

It's likely another service provider will make a bid for Sprint in the near future, even though late last week Sprint CEO William Esrey was publicly downplaying the possibility of his company being acquired. Among those suitors rumored to be interested have been Deutsche Telecom and Bell South. But until last Thursday it was unfeasible for any company to negotiate with Sprint, as WorldCom lingered in the picture.

Sprint already has an Internet backbone, frame relay, ATM, long-distance voice and even some local voice networks. And Sprint, of course, has its crown jewel, Sprint PCS. But Sprint doesn't have any international assets, which may be why most of Sprint's possible suitors bring international flair. ◪

© STEVEN BERNS 2000

"The legacy of Janet Reno, Joel Klein and Bill Kennard will be the remonopolization of local services for consumers."

Bernard Ebbers, president and CEO, WorldCom

Microsoft begins filling in .Net blanks

BY JOHN FONTANA

If Microsoft expects anyone to buy into its .Net Internet platform it must provide the breadth of applications that exists today for Windows, and so the software giant has started to coddle its roughly six million developers.

At its annual Professional Developer's Conference in Orlando last week, Microsoft began detailing the new tools, operating systems and servers that will define .Net, unveiled just last month.

Microsoft handed out evaluation copies of its new .Net Framework programming model and of VisualStudio.Net. Both are designed to ease the creation of software Microsoft calls Web Services using nearly any programming language. Web Services are applications or program logic that live on the Internet and can be used independently or combined into custom applications.

"Microsoft has always recognized the importance of getting developers on board before any major platform shift, and this is no different," says Tom Murphy, an analyst with Meta Group in Stamford, Conn.

AP PHOTO/MARTY LEDERHANDLER

Gates is wooing developers to the .Net Internet platform.

But Microsoft also sought to put a stake in the ground for its enterprise servers. The Windows DNA 2000 servers, including the forthcoming SQL and Exchange, will now be called .Net Servers and will get an XML overhaul.

"DNA servers were about the old three-tier programming model based on HTML," says Barry Goffe, group manager for the .Net developers solution group at Microsoft. "The .Net enterprise servers are less about three-tier and more about Web Services based on standard protocols and XML. Everything will be about integrating with existing infrastructure."

But critics are waiting to see just what Microsoft means by integration.

"I'm suspect of Microsoft saying they can interoperate with any back end [such as Unix or Linux]," says Al Gillen, an analyst with IDC in Framingham, Mass. "They don't have a history of integration, they have to prove they can do it."

Microsoft officials also were coy about how Windows 2000 Server would differ from Windows.Net, the next generation of the operating system.

Microsoft Chairman Bill Gates during his keynote address only described features of the desktop version of Windows.Net 1.0, code-named Whistler. The 1.0 version, expected to ship late next year, will include the ability to save files to the Internet, and a 2.0 version set for release in 2002, code-named Blackcomb, will add natural-language interfaces and will be the first true .Net operating system, he said.

Microsoft also released evaluation copies of its 64-bit Win 2000 operating system that runs on Intel's forthcoming Itanium processor, and kits for both 64-bit software and driver development.

Beyond the operating system, however, Microsoft saved its .Net fanfare for developers, who will build the applications that will define .Net.

Microsoft unveiled VisualStudio.Net, originally called VisualStudio7.0, and .Net Framework, which includes a multilanguage run-time environment and a set of class libraries for constructing the basic building blocks of .Net applications.

The framework includes a Common Language Runtime environment into which developers can compile code written in any of 17 languages, including Perl, Python and Cobol. The framework also includes a common set of APIs for all programming languages, which allows error handling and debugging across languages.

VisualStudio.Net will feature a drag-and-drop environment that supports prebuilt Web Services.

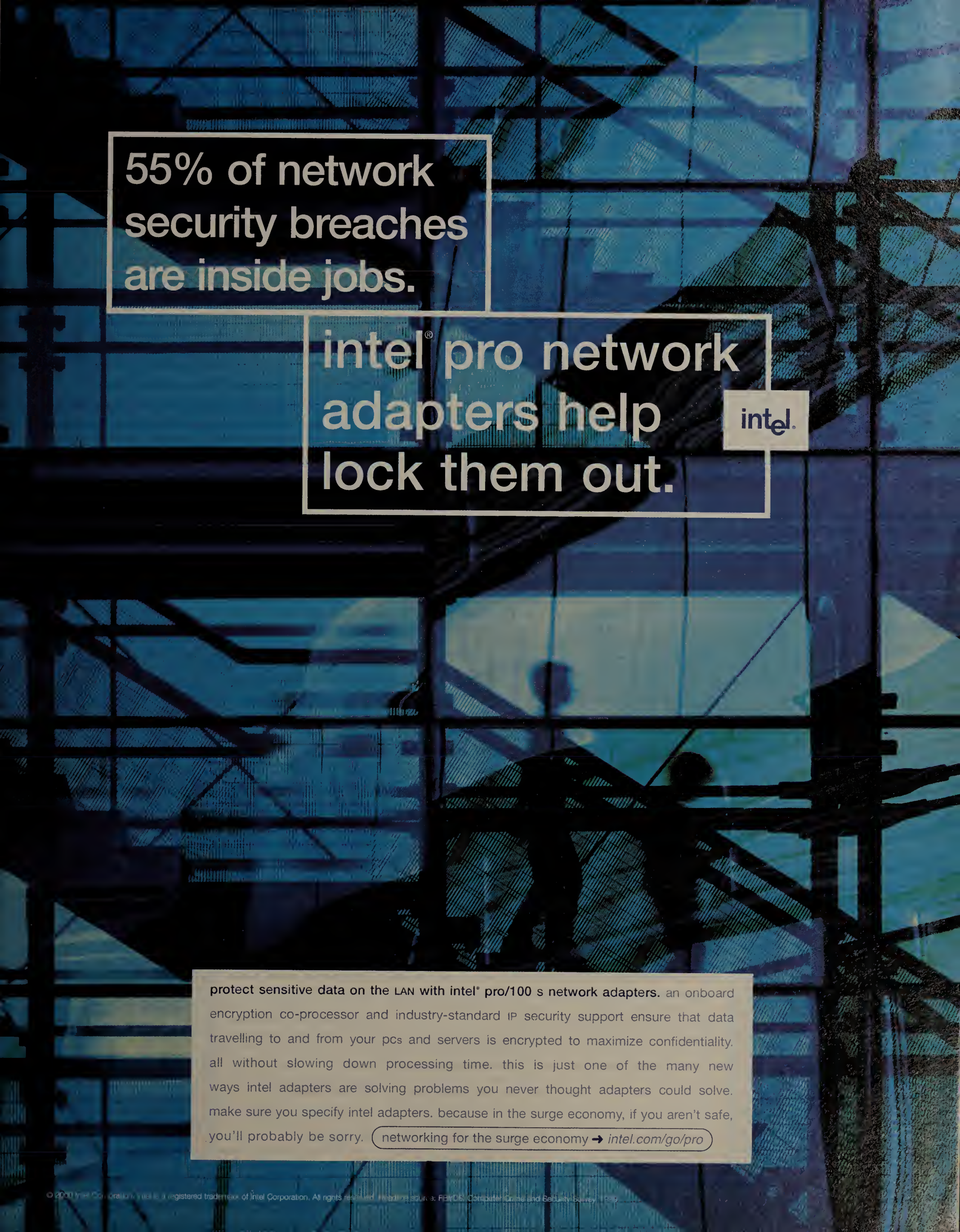
In addition, Microsoft unveiled two extensions to the Simple Object Access Protocol (SOAP) for VisualStudio.Net. The SOAP Contract Language provides a standard way to describe a Web service. SOAP Discovery helps developers locate Web Services. Microsoft intends to seek standardization for both.

Microsoft also unveiled an XML-based language called Xlang that allows Web Services to be strung together based on a predefined workflow.

Also at the conference, Microsoft released Internet Explorer 5.5, which includes support for key Internet standards and performance enhancements. ◪

Correction

A photo accompanying the story "Patently unfair?" (*NW*, July 3, page 1) incorrectly identified the subject. The attorney pictured was Jerry Riedinger, of Seattle firm Perkins Coie.


55% of network security breaches are inside jobs.
intel® pro network adapters help lock them out.
intel.
protect sensitive data on the LAN with intel® pro/100 s network adapters. an onboard encryption co-processor and industry-standard IP security support ensure that data travelling to and from your pcs and servers is encrypted to maximize confidentiality. all without slowing down processing time. this is just one of the many new ways intel adapters are solving problems you never thought adapters could solve. make sure you specify intel adapters. because in the surge economy, if you aren't safe, you'll probably be sorry.
networking for the surge economy ➜ intel.com/go/pro
© 2000 Intel Corporation. Intel is a registered trademark of Intel Corporation. All rights reserved. *Headline source: FBI/CSI Computer Crime and Security Survey, 1999.

Oracle eats its own e-business dog food

BY JOHN COX

The Internet changes everything, as Oracle Chairman and CEO Larry Ellison is fond of saying, endlessly.

It's certainly changing Ellison's company.

In Oracle's just completed fiscal year, executives claim to have squeezed out nearly $1 billion in costs, as part of a plan to change the company into an electronic business. They've done this by adopting "Internet technology" — by using Oracle's own Web-based business applications, by creating new business practices using this software and consolidating data centers.

The scheme has its risks. Oracle will rise or fall on how well its newest applications, for managing customer relationships, perform on the company's intranet. Any glitches will be embarrassingly public and could put the brakes on Oracle's fast-growing applications sales.

And some outsiders are skeptical that the billion dollars in lower costs is because of an "Internet-enabled miracle." "It's not the case," says Laurie Orlov, research director for e-business applications at the Forrester Research market research firm in Cambridge, Mass. "Larry will make the claim that this [lower cost structure] is because Oracle is e-business. Maybe 20% is due to that, that's my guess. But 80% is due to just doing things more efficiently."

Orlov cites the data center consolidation as one example of better efficiency, and likewise with the shift to a new e-mail system. "They had a terrible e-mail system for years," she says. Orlov says there's a limit to moving the sale of expensive, complex software products to do-it-yourself Web sites, such as Oraclestore. "The idea of placing million-dollar orders on the Web just hasn't happened," she says.

Savings due to e-business transformation is for most companies still an opportunity, rather than a reality, according to Orlov.

Still, the accompanying graphic plots Oracle's revenue over eight quarters, along with operating expenses, showing a slight increase of the latter as revenue continues to dramatically increase. The result: Oracle's operating margin — a percentage figure that indicates how well a company is doing in controlling costs — jumped nine points, to 30% from 21% in fiscal 1999, a strong gain.

In true Oracle fashion, the company is turning its success into a new marketing tool: Customers are brought to Oracle's glittering Redwood Shores, Calif., campus headquarters and given in-depth briefings on how the company's Web-based applications and a new computing infrastructure are saving money, slimming down costs, and keeping the number of employees unchanged, despite strong growth in database and applications sales.

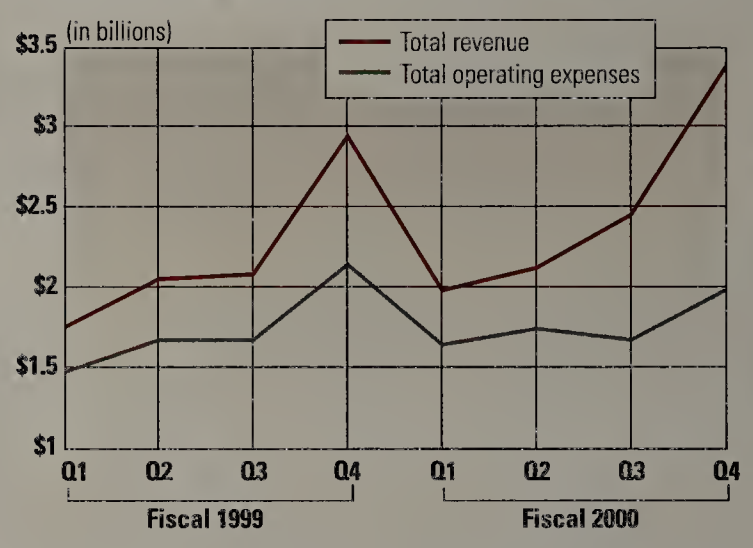
In fact, the move to transform Oracle was doing so well by early spring that Ellison decreed the company will squeeze out an additional $1 billion in costs by the end of fiscal 2001.

The total cost figure of $2 billion for fiscal years 2000 and 2001 represents improved productivity due to a changed cost structure, says Oracle Chief Financial Officer (CFO) Jeff Henley. "As we grew our revenue [in fiscal 2000], we didn't grow our head count or our expenses," he says. "We kept more of the money we took in. In business, that's always a good thing."

Total operating revenue grew 15%, to $10.1 billion, in fiscal 2000, up from $8.83 billion the year before. Total operating expenses grew only 1%, to $7.05 billion, up from $6.95 billion. The impact on operating income, which is roughly the pretax profit from sales, was dramatic: 64%, to $3.08 billion from $1.87 billion. "Effectively, this means we're getting $2 billion falling to our bottom line," says Henley, who emphasizes the figure is a goal, not a guarantee.

Web boosts Oracle profits

Web applications, new business practices and IT consolidation are helping Oracle restructure costs and keep the head count down, despite healthy growth. The result: Fiscal 2000 operating income surged 64% over the previous year.



SOURCE: ORACLE, REDWOOD SHORES, CALIF. Note: Oracle's fiscal year ends May 31.

All companies have costs, such as salespeople salaries, advertising and office supplies. These costs usually increase as the company's revenue rises and as it hires more people, increases advertising, expands office space and so on. Using Web applications, and consolidating servers and data, has changed the way Oracle's costs are incurred, and lessened the need to hire new people. In some areas, staffing has been reduced.

Two years ago, Henley says, Ellison decided Oracle would use its own products to exploit the Internet's potential, a decision that has led to a top-to-bottom rethinking of how the company does business. One of the first steps was a Web-based corporate expense report. According to Henley, employees now get their reimbursements paid directly into their bank accounts a week faster than was possible with the old paper system. More importantly, the accounts payable department, which processed all the paper, cut its head count by 25%.

As other browser-accessible applications began to be used, Oracle began consolidating hundreds of servers and databases into one or two main sites. The company has just finished consolidating its e-mail system. Instead of 97 servers and 120 databases, Oracle e-mail now runs on two big, clustered servers with four databases. Instead of 60 full-time IT staff just for e-mail, there are now 12, says Gary Roberts, senior vice president of the company's global information technologies group.

By also converting from a client/server e-mail model to an Internet model, support costs are dropping dramatically. "In our old e-mail environment, we'd get 3,000 problem calls a month [to our help desks], just for e-mail problems," Roberts says. "With our Internet model, I get less than 250 per month: There's not much [a user] can do to mess up a browser."

The same logic has led to a goal of moving 65% of Oracle's 41,000 employees to a browser-only desktop. If that's achieved, Roberts calculates he can cut the 450 desktop support specialists to 100, and save $60 million per year.

The corporate network was also studied, to make sure it could support the increased Web traffic. In some cases, Oracle added more bandwidth and reconfigured the network to improve throughput and reduce network latencies.

The company inventoried more than 100 custom-built applications it used to run its business, such as lead tracking, of which there were several variants. Roberts recalls Ellison asking at a strategy meeting on applications architecture, "If we need all this stuff to run our business, why isn't it in the [Oracle Applications suite]?"

The IT group's internal applications support staff began working with software engineers on the product side to shift needed features and entire programs into the 11 and 11i releases of the suite. Several internal sales programs are now a module in the 11i release, called Oracle Sales Online. All features can be accessed with a Web browser.

Business processes are being re-examined and changed when necessary to fit the Web. "We're forcing ourselves to standardize our business practices, so there is only one way to take an order," says Ron Wohl, the executive vice president who oversees development of the Oracle Applications product line. "We're not automating old business practices."

As Oracle's own sales and marketing staff began using the new applications, costs associated with these areas began to plummet. During the earnings teleconference last month, Ellison told analysts that marketing seminars for customers had been shifted from hotels to the Web, and cost per person had dropped from $220 to $1.50.

In addition, the support staff has grown typically 30 to 40% per year as the company has grown. "But in 2,000, we added zero people, and we plan to add zero people this year," Henley says. ◪

network maintenance can take up 27% of your time.
intel® pro network adapters help take it back.
intel.
simplify LAN maintenance with intel® pro/100 network adapters. with singledriver™ technology, you can install and maintain your network connections using just one cd. one solution from top to bottom. from pcs to servers to notebooks. the result: valuable time and money saved. this is just one of the many new ways intel adapters are solving problems you never thought adapters could solve. make sure you specify intel adapters. because in the surge economy, lost minutes take months to make up for.
networking for the surge economy → intel.com/go/singledriver
©2000 Intel Corporation. Intel is a registered tradema
Headline source: IDC's 1998 Network Support and Int
rights reserved.

Women,
continued from page 9

2003, says Meta Group, a consultancy in Westport, Conn. Also, the Bureau of Labor Statistics shows that the technology field will create more than five million new jobs between now and 2008. Plus, American universities and colleges, with a reported 45,000 computer science graduates per year, are not feeding enough new workers into the field.

Even Microsoft has difficulty finding enough IT workers; 10% to 15% of positions are vacant, with IT jobs being the hardest to fill, a company spokesman says.

Dollar discrepancies

According to the 1999 Network World Salary Survey, women working in IT earn a fraction of their male counterparts' paychecks, averaging 72 cents on the dollar for female network professionals.

Turning the tide

That's the problem the commission tackled while it traveled the country for a year, holding meetings with educators, engineers, hiring professionals and industry leaders.

The recommendations they came up with are multifold (see graphic below). They range from holding companies accountable for the percentage and pay scale of their female, minority and persons with disability employees to making sure the nation's teachers and classrooms are properly prepared to educate children in math and sciences.

"These are good recommendations," says Catherine Didion, executive director for the Association for Women in Science in Washington, D.C. "We need to have some accountability in terms of putting these recommendations into action. It's really important that the people who follow up on this be leaders in the industry, government and academia."

Having spearheaded the creation of the commission, Congresswoman Constance Morella (R-Md.) already is working to put together a group with the responsibility of driving these recommendations forward. She said she wants the group, which would greatly be involved in lobbying and education, to be comprised of leaders from industry, government and academia. While she said she's not sure how long it will take to pull the group together, she is focusing on its creation.

Morella says she is calling in executives from the major industry players, trying to set up a meeting for this summer. She wants them to sit down and discuss what they can do and, more importantly, what they will do to integrate more women, minorities and people with disabilities into their workforces.

Morella also has called on the companies, including Microsoft, IBM, Intel and AT&T, which pledged a few months ago at a White House meeting to donate $1 million per year for 10 years to creating diversity in employment. She said she is asking them to give a segment of that annual donation for three years to fund the commission's recommendations.

Members of the National Scienee Foundation are reportedly reworking their scholarship funding, as well as ways to better connect community colleges with four-year institutions.

Sonya Allen, director of global work environment and diversity at Xerox, says the company sees the need for change and is ready to move forward supporting the recommendations.

"This is very critical. It's something we should have moved forward on a few years ago," says Allen, who attended the Congressional hearing in support of the commission.

Allen also supports the commission's recommendation that companies report the percentage of and the pay parity of their female and minority workers. "It could be embarrassing, but it could be effective," she says.

"Many of the larger institutions that haven't been trying to be more diverse will have to play tremendous catch-up. On paper, they will not look good."

Gail Naughton, president and chief operating officer, Advanced Tissue Sciences

Gail Naughton, president and chief operating officer of Advanced Tissue Sciences in La Jolla, Calif., says an annual corporate report could be beneficial and as easily done as making it part of public companies' yearly 10K filing.

"I'm sure there will be resistance," says Naughton, who was the first woman ever named Inventor of the Year by the Intellectual Property Owners. "Many of the larger institutions that haven't been trying to be more diverse will have to play tremendous catch-up. On paper, they will not look good."

Naughton and others say the worker shortage will only worsen if it's not addressed immediately.

"If we don't do something now, there's going to be some big problems not far down the road," Didion says.

Fixing an embedded problem

To pick up some of that workforce slack, corporations have turned to the government, pleading for increases in the number of H1-B visas, which allow businesses to hire and import foreign workers for a limited amount of time. Congress raised the ceiling from 65,000 to 115,000 in 1999, and the cap was maxed out halfway through the year.

And the problem with H1-B visas, some say, is that the workers brought in and trained soon will have to return to work in their own countries. That means U.S. companies using them will continually be training and losing workers.

And what is causing this shortage of workers? It's a question that members of the commission studied before they even looked at ways to tackle it. Among the many problems they found were:

- Women working in IT earn a fraction of their male counterparts, averaging 72 cents on the dollar for female network professionals, according to the 1999 Network World Salary Survey.
- Some teachers, guidance counselors and parents are still guiding girls away from science and math classes.
- Most science teachers — and hence role models — are men. For example, at the university level in the U.S., 94% of the engineering faculty is male.
- The long hours often expected in the high-tech industry are difficult to balance with family responsibilities.
- There has been a disconnect between community colleges, which educate a large number of women and minorities, and four-year colleges.
- The stereotype of the geeky IT worker with the pocket protector, high-water pants and taped-up glasses is a tough one to swallow for teenage girls, especially those who may be wrestling with a general drop in self-esteem that tends to occur at that age.
- The male-dominated industry can be a lonely and tough old-boys club to break into. ◪

The IT gender gap

According to a study by the U.S. Department of Commerce, women are greatly under-represented in most IT categories.

Electrical and electronic engineers (603,000 total)

Computer systems analysts and scientists (1 million total)

Computer programmers (558,000 total)

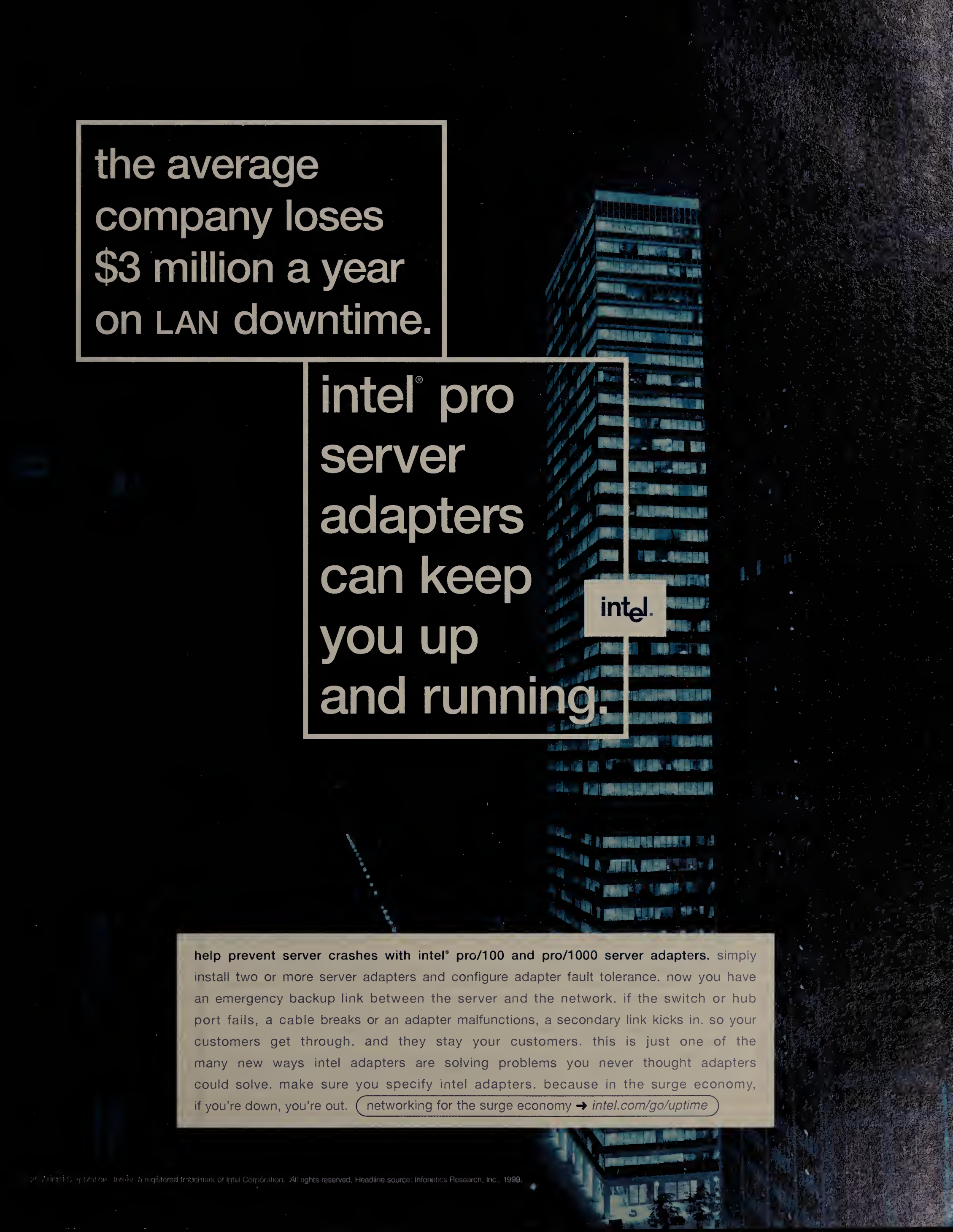
As a result, the Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development has made several recommendations:

- High-tech employers in the public and private sectors be held accountable for the career development of their employees who are women, minorities or have disabilities.
- The degree of participation, comparative pay, level of pay at hire, career development and advancement of women, minorities and persons with disabilities in the high-tech workplace be reported yearly.
- The establishment of a system of awards to recognize exemplary employers in business, government and higher education to achieve diversity in the high-tech workplace.
- The establishment of a group — out of the public, private, academic and government sectors — to improve the image of high-tech professionals.

SOURCE: IDC, FRAMINGHAM, MASS

www.nwfusion.com
WOMEN IN IT
- **Feature:** The critical shortage of women in IT.
- **Report:** An analysis of the workplace gap.
- **Forum:** Sexism in IT.

DocFinder 9053
find it online


the average company loses $3 million a year on LAN downtime.
intel® pro server adapters can keep you up and running.
intel.
help prevent server crashes with intel® pro/100 and pro/1000 server adapters. simply install two or more server adapters and configure adapter fault tolerance. now you have an emergency backup link between the server and the network. if the switch or hub port fails, a cable breaks or an adapter malfunctions, a secondary link kicks in. so your customers get through. and they stay your customers. this is just one of the many new ways intel adapters are solving problems you never thought adapters could solve. make sure you specify intel adapters. because in the surge economy, if you're down, you're out.
networking for the surge economy ➜ intel.com/go/uptime
Intel is a registered trademark of Intel Corporation. All rights reserved. Headline source: Infonetics Research, Inc., 1999.

Military outlines e-business battle plan

BY ELLEN MESSMER

WASHINGTON, D.C. — Following a year-long review, the Department of Defense last week outlined its plan to improve e-commerce with suppliers by coordinating more closely with industry, as well as radically altering internal technology and accounting practices.

Speaking at last week's e-Gov conference in Washington, Defense Department officials said they intend to establish the internal Electronic Business Board of Directors that would be responsible for coordinating e-commerce activities across the U.S. Army, Navy, Air Force and other agencies. In addition, the Defense Department wants its traditional department chief information officers to play a stronger role in setting e-business policies, perhaps by appointing e-commerce managers to be "ruthless change agents" to shake up operations.

"For e-business, the most successful departments in the military had someone who was a ruthless hands-on change agent who didn't care about making friends," said Evelyn DePalma, chief of the Defense Information Systems Agency's technology team spearheading the Pentagon e-commerce reform effort. "It's mostly men," she added. "But that doesn't mean women can't fill that role."

The Defense Department team not only visited defense agencies, but met extensively with industry suppliers, including technology suppliers Cisco, Oracle, Unisys, Microsoft and EDS, as well as equipment suppliers such as Lockheed Martin, TRW and Boeing, to collect ideas for improving e-commerce.

This joint defense and industry effort culminated in a set of recommendations disclosed last week. They include the goal of establishing the Electronic Business Board of Directors, something likely to be accomplished by December. This board will try to coordinate e-commerce activities across the military as well as consult with an industry counterpart to be called the EB Industry Panel.

The military also wants to promote new methods of doing business by rewarding its workers in successful e-commerce projects that result in savings or efficiency. Traditionally, accounting rules don't allow savings to be allotted as bonuses; in fact, traditional practices tend to discourage savings at all, said several Defense Department personnel involved in the e-commerce review.

However, the Defense Department will have to buck bureaucratic currents to turn its battleship around in the waters of e-commerce.

Accommodating some of the goals outlined last week will probably require changes to the military's procurement rules, known as the "5000 Series." This may take at least six months to accomplish.

Otto Guenther, former Army CIO and now head of Computer Associates' federal division, commented that the military lacks the kind of e-commerce manager position that is becoming the norm in private sector organizations.

"This is an acknowledgement from them that the world has changed, particularly as involves ordering via the Web, [and] that they need to know how to leverage off-the-shelf software better," Guenther said.

Although the Defense Department last week had a humble attitude about e-commerce, in truth the military is hardly naive about it, having used older technologies such as Electronic Data Interchange for decades.

The military also has been an early pioneer in electronic malls that can be used to order supplies. The Army and Navy are also testing some of the newest forms of procurement, such as reverse auctions. At Fort Monmouth, N.J., for example, the Army's Communications and Electronics Command is piloting the use of an online auction site that lets Army suppliers dynamically bid against each other. The traditional bidding method would have been paper-based or by phone.

The auction site, based on technology from Moai and Frictionless Commerce, has so far been used to purchase secure encryption-capable fax machines and IBM ThinkPads from government-registered suppliers bidding on small contracts, said project director Edward Elgart.

Comtech Federal won the ThinkPad bidding battle against Micro Warehouse and Daley Computers. The winning bid was $3,280 for a computer that listed for $7,000 on the government contract known as the GSA Schedule.

"We're trying to establish a proof of principle here with this pilot, but it looks like online bidding may result in lower prices," said Elgart. ◪

An e-comm battle plan

The Department of Defense set the following goals to improve e-commerce with its suppliers:

- Establish focal points for e-business by creating the Electronic Business Board of Directors.
- Meet quarterly with the EB Industry Panel, a group of technology industry vendors, to coordinate e-business activities.
- Amend the department's "5000 Series" rules to allow the department to distribute any savings resulting from e-commerce practices directly to employees as bonuses.
- Direct its chief information officers to establish e-business policies, possibly assigning an e-commerce manager as "ruthless change agent" to push for e-commerce based on off-the-shelf software or services.

Team,
continued from page 10

Old World," says Eugene Lee, a Cisco vice president of marketing, referring to telephony stalwarts Lucent and Nortel Networks and to corporate telecom staffs. "The [data] network and phone guys really collide the hardest at the call center. We now have the killer applications that will drag [voice/data] convergence into the call center so the balance of power will shift back to the data center."

Also, Cisco and Oracle say customers will need to barter with only two vendors for their IP call center needs instead of as many as 12. As a result, the number of IP-enabled call centers will increase fivefold between 1998 and 2003, they say.

"The long-term is that we're headed for a more IP-centric infrastructure overall, and you can mix business and communications services much more easily and flexibly with IP," says Aberdeen Group Analyst Bill Hills. "In the near-term, Cisco and Oracle just have to show people the value of integrating the communications infrastructure with the business applications infrastructure."

"It is ambitious," says Household's Roy. "And there are some competing components" in the Cisco and Oracle offerings, including e-mail and call routing, and data-mining technology, he says. "They need to work that out and make sure out of the box there isn't any competition there. But I think they can pull it off," he says.

The companies will integrate Oracle's E-Business Suite 11i software and Cisco's Intelligent Contact Manager and Customer Interaction Suite software. This software performs site and network-based queuing, routing, media blending, ACD and IVR integration for Internet telephony, as well as Web interaction for collaborative and chat sessions.

The joint offering is expected to provide capabilities for managing various customer interaction methods, including phone, e-mail, Web collaboration, Web chat, IVR and voice over IP.

The firms plan to deliver products in phases and are currently in trials with the first phase, which is CTI integration with Cisco's ICM software and Oracle's CRM applications.

Phase 2, slated for the first half of 2001, will be an integrated customer interaction system from the companies. Phase 3, also scheduled for 2001, will be an integrated system packaged for hosted environments, such as those operated by application service providers. ◪

NetworkWorld

Editorial Director: John Gallant
Editor in Chief: John Dix

NEWS
Executive Editor, News: Doug Barney
News Editor: Bob Brown
Associate News Editor: Michael Cooney, (508) 490-6418
Associate News Editor: Paul McNamara, (508) 490-6471

INFRASTRUCTURE
Senior Editor: John Fontana, (303) 377-9057, Fax: (303) 377-9059
Senior Editor: John Cox, (978) 834-0554, Fax: (978) 834-0558
Senior Editor: Deni Connor, (512) 345-3850, Fax: (512) 345-3860
Senior Editor: Jim Duffy, (508) 490-6525
Senior Writer: Marc Songini, (508) 490-6484
Senior Writer: April Jacobs, (603) 742-1789
Staff Writer: Phil Hochmuth (508) 490-6442

CARRIERS & ISPs
Senior Editor: David Rohde (202) 879-6758; Fax: (202) 347-2365
Senior Editor: Tim Greene, (508) 490-6422
Senior Editor: Denise Pappalardo (202) 879-6745; Fax: (202) 347-2365

ENTERPRISE APPLICATIONS
Senior Editor: Ellen Messmer, (202) 879-6752, Fax: (202) 347-2365
Senior Editor: Carolyn Duffy Marsan, (703) 917-8621; Fax: (703) 917-8622

COPY DESK/LAYOUT
Assistant Managing Editor: Melissa Shaw
Copy Chief: Denise Dubie
Copy Editors: John Dooley, Ryan Francis, Monica Hamilton, Ian Lamont

ART
Design Director: Rob Stave
Art Director: Tom Norton
Assistant Art Director: Paul M. Lea
Senior Designer: Stephen Sauer
Graphic Designer: Lisa Hovsepian
Infographics Researcher: Jacy Edalman

FEATURES
Features Editor: Neal Weinberg, (508) 490-6449
Managing Editor, Features: Amy Schurr, (508) 490-6465
Features Writer: Sharon Gaudin (508) 490-6419
Associate Features Editor: Susan Collins, (508) 490-6413
Associate Features Editor: Suzanne Gaspar, (508) 490-6489

REVIEWS
Technology Editor: Mark Brownstein (818) 727-9059; Fax (818) 885-6900
Test Alliance Director: Christine Burns (508) 490-6456
Reviews Editor: Keith Shaw, (508) 490-6527
Test Alliance Partners: Mark Gibbs, Gibbs & Co.; Joel Snyder, Opus One; Dennis Williams, ProductReviews.com; John Bass, Centennial Networking Labs; Bob Currier, Duke University; Tere' Bracco, Current Analysis; Barry Nance, Independent consultant; Thomas Powell, PINT; Edwin Mier, Mier Communications, Thomas Henderson, ExtremeLabs; NTS/XXCAL
Contributing Editors: Daniel Briere, Mark Gibbs, James Kobielus, Mark Miller

NETWORK WORLD FUSION
Executive Editor, Online: Adam Gaffin, (508) 490-6433
Managing Editor: Sandra Gittlen, (508) 490-8431
Editor, E-mail Newsletters: Jaff Caruso, (650) 577-2714, Fax (650) 358-4518
Associate Online News Editor: Ann Sullivan, (773) 525-0674
Staff Writer: Jason Meserve, (508) 490-6567
Senior Online Copy Editor: Sheryl Hodge, (508) 490-6532
Web Producer: Marlo Matoska, (508) 490-6439

SIGNATURE SERIES
Executive Editor: Beth Schultz, (773) 283-0213, Fax: (773) 283-0214
Senior Editor: Julie Bort (970) 468-2864, Fax: (970) 468-2348
Art Director: Tom Norton
Copy Chief: Denise Dubie
Copy Editor: Ian Lamont

Editorial Operations Manager: Cheryl Crivello
Office Manager, Editorial: Glanna Fasold
Editorial Assistant: Pat Josefek
Research Assistant: Deidra Massanbarg
Editorial Intern: Geoff Stevens
Main phone: (508) 460-3333
E-mail: first name_last name@nww.com

So, you need to combine multiple financial branches into one fast and efficient network, ensure high-speed access

to networks of customer account databases and step up your data-intensive security transactions capabilities?

That's your business.

Helping you do it is ours.

GTE Data Solutions. Flexible. Scalable. Complete. Ones and zeros have never been more a part of your company's core business. That's why GTE Data Solutions is the perfect partner for you. From network design and development through implementation, we offer you a complete portfolio of end-to-end solutions featuring the latest broadband technologies. And with over 75 years' experience building communications networks, there's no one better to keep you apprised of emerging technologies. So, for data, video, voice or a combination of all three, GTE Data Solutions is ready to grow with your company. **Visit www.gte.com/datasolutions/net today for more information and to register for three complimentary issues of MIT's Technology Review or call 1-877-483-7755.**

GTE Data Solutions

ATM • Frame Relay • VideoConnect® • Network Management • DSL • Data CPE

GTE Reads

New head of Internet Architecture Board speaks out

NetworkWorld Q&A

John Klensin, a former Massachusetts Institute of Technology researcher who helped design the Internet's original file transfer and e-mail systems in the late 1960s, spoke recently with Network World *Senior Editor Carolyn Duffy Marsan about his new post as chair of the Internet Architecture Board (IAB), the strategic planning arm of the Internet Engineering Task Force (IETF).*

What is the role of the IAB chair?

The Internet Engineering Steering Group has responsibility for the standards and the day-to-day operation of the IETF, the working groups, and so on. The IAB has responsibility for taking a longer-term architectural view and worrying about strategic questions. The IAB chair's role is coordination, agenda setting and becoming the point person on a lot of external relationships.

How does your IAB role fit in with your position as Internet architecture vice president at AT&T?

The IAB position is volunteer work. AT&T has been kind, generous and patient enough to give me the time and resources to do it.

What issues do you think are most important for the IAB to consider?

Scaling, scaling and scaling. And I hope that's the same answer you would have gotten two or three years ago. The problem continues, and it's an inevitable consequence of Internet growth. It's scaling with regard to how we operate the IETF, as the demand for protocol development increases and the number of people who are able to work — both technically and from a resource standpoint — doesn't increase nearly as quickly.

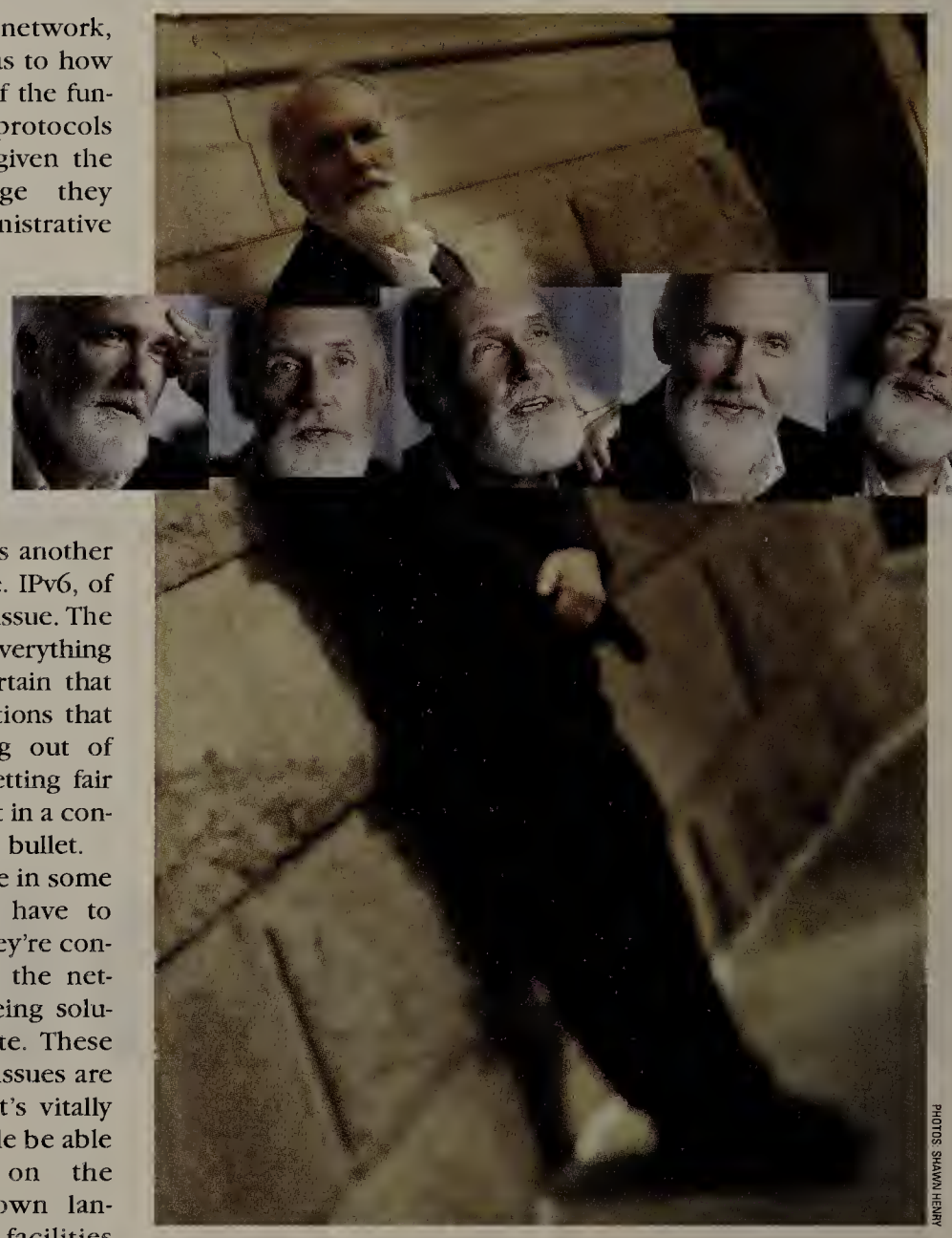
In scaling the network, there are questions as to how much longer some of the fundamental routing protocols are going to work given the level of knowledge they require. The administrative issues and the ICANN [Internet Corporation for Assigned Names and Numbers] situation are, in some respects, merely another scaling problem. Arguably, internationalization is another kind of scaling issue. IPv6, of course, is a scaling issue. The IAB is trying to do everything we can to make certain that IPv6 and other solutions that prevent our running out of address space are getting fair consideration but not in a context of being a magic bullet.

As solutions evolve in some of these areas, we have to make certain that they're consistent with scaling the network rather than being solutions that fractionate. These internationalization issues are a typical example. It's vitally important that people be able to communicate on the Internet in their own languages and use facilities based in those languages. At the same time, it would be quite unfortunate if the potential for human communication and e-commerce between countries were suddenly frustrated because we set up language and naming barriers.

Another key role of the IAB is to look at emerging activities in the IETF. Which ones do you find most interesting?

I certainly see working with nonhard-wired devices and mobility and portability as very important. I see the continuing evolution in how we name and identify things on the Web and elsewhere as being an important problem that we are beginning to make some progress on. The Domain Name System security issues are very important. Internationalization is vital.

I am personally very worried about instant messaging — less about the protocols and the issue of AOL vs. everyone else and much more about how we efficiently manage a technology that has a lot of potential for being extremely useful and a lot of potential for making noise in people's lives.



PHOTOS: SHAWN HENRY

Can you describe the IAB's relationship with ICANN?

Sometimes we look at ICANN in complete horror, and then we realize that all of the alternatives probably range between worse and much worse. We're quite happy to leave most of the policy questions to ICANN that ICANN is taking on.

Figuring out whether a new top-level domain should be allocated and what it should be called is one of these areas in which the IAB and the IETF have opinions but no competence. We will give advice to ICANN on some of the ideas that we consider dangerous to the way the Internet operates. We have a pretty good working relationship about 90% of the time and a serious headache the other 10. To paraphrase a colleague of mine: It's a source of continuing amazement how many politicians, committees, meetings and organizational structures it takes to replace one very competent and thoughtful engineer.

One of the hot buttons in the IETF is the issue of migrating from the current IPv4 to IPv6. Where do you stand on IPv6?

I understand IPv6 at a 10,000- or 30,000-foot level. I am statistician enough and data analyst enough to be able to read the handwriting on the wall about Internet address space exhaustion and to have my own predictions about how quickly that's going to happen. But IPv6 is not a protocol that I could design. It is not a protocol that I made significant contributions to. I can tell you it's really important. And I can tell you that all the other solutions are either worse or nonstarters. I am certainly an advocate of IPv6.

You've been involved in Internet research and protocol development for 30 years. Not many people can say that. What is your view of the Internet's promise today compared to what you thought 30 years ago?

There's a myth that nobody anticipated any of this growth or any of this penetration 30 years ago. Not only were we anticipating it, we were discussing it. So from that standpoint, we're on track. I really want to see this as a communications medium and an enabling one. And the e-commerce thrust fits right into that picture.

But I'm concerned that the Internet could become a one-way distribution medium for entertainment for pure economic reasons. And if it does that in a way that squeezes the communications aspects out, that will be very disappointing. If it happens in a way that spreads the network and increases the resources available to it, that will be wonderful. Which way those pressures will play themselves out is very hard to predict.

How might the IAB change under your leadership?

It's hard to say. I am the first IAB chair whose principal technieal interest and background is applications rather than deeper-level transport or routing. That means I'm a little closer — just by background and instinct — to some of the hotter topics of today such as telephony, security or policy issues.

There are topics that come up at the fundamental technology level of the Internet that I can participate in as an educated lay person, but neither I nor anybody else has any delusions that I'm a serious expert. In that respect, a number of things are turning into a more collegial effort within the IAB because we're increasingly having to recognize that no one person has all the necessary expertise. ◪

mySAP.com

who better to put you on the web than the company that helped put you on the map?

In the past 27 years, SAP has helped over 20,000 customers in dozens of industries become more successful. Now, mySAP.com™ brings the same level of knowledge and expertise to the next phase of your business: putting it on the Web. And because we're already your partner, we can help you become a fully integrated e-business faster and more economically than you'd imagine. So your employees, customers, and suppliers—along with your front and back office—can work together seamlessly in real time. Want to know how you can put your e-business on the map? Visit www.mysap.com and we'll show you.

you can. it does.

©2000 SAP AG. SAP, the SAP logo, and the mySAP.com logo are registered trademarks of SAP AG in Germany and several other countries.

extreme networks

MAN's BEST FRIEND.

Presenting the first switches to offer Ethernet service provisioning for MANs, Internet exchanges and cyber building networks.

Looking for a way to deliver more bandwidth to your broadband infrastructure? How about a way to slice and serve that bandwidth with incredible granularity and flexibility while guaranteeing fixed latency for delay-sensitive services such as video and voice? Add the ability to deliver different classes of IP transport services to your customers by combining IETF DiffServ and quality of service while simultaneously providing the necessary billing information and you've got the ideal switch for MANs, Internet exchanges and cyber buildings. You get SONET-like resiliency between customer access points on the network. Plus WDM to increase carrying capacity by allocating bandwidth to multiple wavelengths on a single fiber. It's that simple. Oh, one other thing. As the case with all Extreme Gigabit Ethernet Layer 3 switches, the Alpine 3808 and 3804 Ethernet service provisioning switches are housebroken and won't chew up the furniture, but you probably knew that.

www.extremenetworks.com/go/nw2.htm

888-257-3000, ext. 3131 (U.S.)
+1 408-579-3131 (Outside U.S.)

The new Alpine™ 3808 and 3804. The industry's first Ethernet service provisioning switches.

Networks is a registered trademark, and Alpine and the Extreme Networks logo are ... Networks. All ... company ...ames or products are trademarks or registered trademarks of their respective companies.

Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Quantum/ATL has announced a hardware/software product, the Prism LP130 Storage Consolidation Option, that makes it possible to logically carve up the company's tape libraries and share them among heterogeneous Unix, Windows NT, Windows 2000 and mainframe servers. The Prism LP130 lets each tape library be divided into 16 virtual partitions. Each virtual partition can be managed by a different storage management application, such as Veritas' NetBackup. The Prism LP130 works with the Quantum/ATL P3000 or P6000 Prism Management Card and contains a browser-based management tool. It is available starting at $13,000.

Quantum: www.atlp.com

Asante Technologies has introduced the FriendlyNET FH300 and FS5000 Series of stackable hubs and switches for connecting Macs and PCs in small remote offices or schools. The FH300 and FS5000 series are 10/100M bit/sec Fast Ethernet hubs with support for AppleShare, AppleTalk and TCP/IP routing protocols. The FS5005 stackable switch with five 10/100 LAN ports costs $88. The FS5008 stackable switch with eight 10/100 LAN ports is $139. The FH305 stackable hub with five 10/100 LAN ports is $75, and the FH308 stackable hub with eight 10/100 LAN ports is $105. All models will begin shipping this month.

Asante: www.buyasante.com

Hewlett-Packard last week announced it has cut prices on various HP ProCurve switches and hubs. The new prices are as follows: HP ProCurve Switch 4000M, $3,299, reduced from $3,599; HP ProCurve Switch 6208M-SX, $10,349, from $11,499; HP ProCurve 10/100 Hub 12, $399, from $499; and HP ProCurve 10/100 Hub 24, $499, from $649.

Hewlett Packard: www.hp.com

3Com boosts wireless LAN security

BY PHIL HOCHMUTH

SANTA CLARA — Whether it's a cell phone, PDA or 802.11b LAN, security can be a major sticking point for any user thinking of moving to wireless technology.

3Com aims to change that. The company recently announced a new product that will provide 802.11b, 11M bit/sec wireless LAN users with VPN-like data encryption and security.

3Com's Superstack II Router 400 — to be released this fall — will provide secure, encrypted network access in a wireless LAN, supporting up to 256 wireless clients per router.

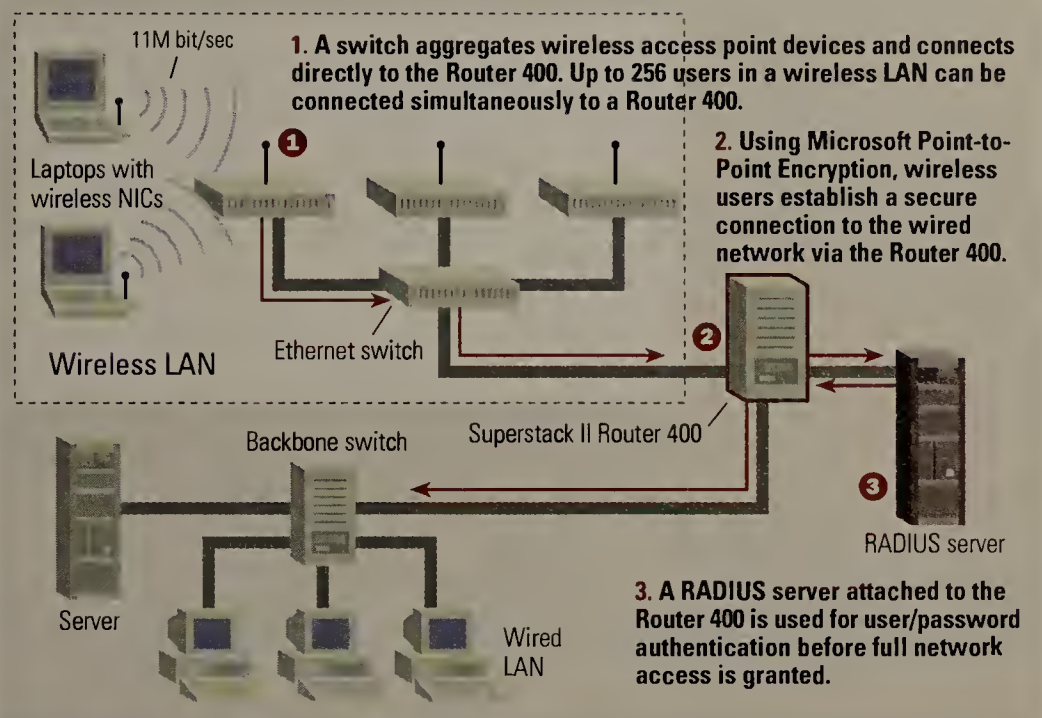
"Security will always be a problem when you have signals traveling through the air," says Rick Bilodeau, marketing director of 3Com's wireless products division.

"Most of the products out there for wireless LAN security have involved using the Layer 2 access control method and Layer 2 data encrypting" Bilodeau says.

See **3Com**, page 26

3Com secures the wireless LAN

3Com's Superstack II Router 400 will use Layer 3 encrypted tunneling technology to secure wireless LAN traffic in large wireless enterprise networks.



1. A switch aggregates wireless access point devices and connects directly to the Router 400. Up to 256 users in a wireless LAN can be connected simultaneously to a Router 400.

2. Using Microsoft Point-to-Point Encryption, wireless users establish a secure connection to the wired network via the Router 400.

3. A RADIUS server attached to the Router 400 is used for user/password authentication before full network access is granted.

Start-up Pirus building storage net 'uber-switch'

BY DENI CONNOR

ACTON, MASS. — With a variety of proposals pending in the Internet Engineering Task Force for routing storage across IP networks, Pirus claims its new IP storage device will work with all of them.

The Pirus device, with its Fibre Channel, Gigabit Ethernet and SCSI connectivity support, will let servers, storage and network-attached storage (NAS) devices, IP and Fibre Channel switches on storage-area networks (SAN), WANs or LANs join together to improve storage data transmission across corporate networks.

A variety of storage and network vendors have proposed storage network technologies with the IETF. For example, Gadzoox and Lucent have proposed Fibre Channel over IP, which lets a storage administrator route SANs across a metropolitan-area network using dense wave division multiplexing. IBM and Cisco have submitted a draft that suggests running SCSI storage data over TCP and avoiding Fibre Channel altogether. SAN Ltd. has submitted plans to use the Service Specific Connection Oriented Protocol — which is used in ATM — to route storage data over IP using a protocol that lets data be retransmitted selectively if problems occur.

The unnamed Pirus device will route, switch and bridge multiple protocols over a variety of links, among them X.25, frame relay and ISDN. The box can be configured to join IP switches with Fibre Channel switches, to join NASs to a SAN, or to improve communications between a number of heterogeneous Windows NT, Unix, NetWare or Linux servers and a SAN. It will route or switch data between these devices as requested. Pirus expects the product to ship this year.

"Of every product I've seen, Pirus is the only company doing a large, director-level chassis that can mediate any protocol or communication link," says Steve Duplessie, an analyst with Enterprise Storage Group in Milford, Mass.

Ancor, InRange Technologies and McData have directory-level Fibre Channel switches. Unlike Pirus' box, they are limited to only Fibre Channel technology. "You could call the Pirus chassis the 'uber-switch' for storage area networks," Duplessie says. With the Pirus device, storage administrators can expand their SANs by adding blades for whichever technology they want to use.

There is only anecdotal evidence concerning the size of the storage-over-IP market. Mike Kahn, an analyst with Clipper Group in Wellesley, Mass., says conversations with users suggest switching to an IP network can reduce data transmission costs by as much as 50%.

Pirus estimates the size of the storage-over-IP market will be more than $2.5 billion by 2003.

Founded in December by network veterans Rich Corley and Chris Cochran, Pirus is pouring $10.2 million of venture funding into developing its IP storage device. The company has 48 employees, 36 of whom are engineers.

Pirus: www.pirus.com

Storage

Subscribe to our free newsletter. DocFinder: 5434

There's a New Wireless World Out There...

The New AirStation™ wireless solution is your portal to freedom!

Freedom to Move • Your world without wires means you can use your computer [illegible] Move from your desk to [illegible] from the den out [illegible]

[illegible] & Share Alike • [illegible] your files [illegible]

It's Fast & Easy • [illegible] Easy [illegible] Easy [illegible] do it!

Freedom & Security • With the AirStation's [illegible] platform and wireless [illegible] safe and secure!

Lose the Wires, Find Your Freedom! [illegible] Buffalo Technology's new [illegible] wireless [illegible] visit our web site at [illegible] call **800.508.1110.**

BUFFALO

www.buffalotech.com

AirStation™ Internet Sharing Device

Wi Fi™ The Standard for Wireless Fidelity.

[illegible] Buffalo's [illegible] names [illegible] registered

IBM, Microsoft and Intel team on super cluster

IDG NEWS SERVICE AND NETWORK WORLD STAFF

IBM, Microsoft and Intel last week jointly announced a server cluster software and hardware package touted as the world's fastest — and cheaper than the competition.

The server cluster performs 440,879 transactions per minute in a configuration that includes 32 IBM Netfinity 8500R machines and Intel Pentium III Xeon processors running IBM's DB2 Universal Database and Microsoft Windows 2000 Advanced Server operating system, the companies say.

The performance numbers were audited using the Transaction Processing Performance Council, type C benchmark (TPC-C). The audit showed the transactions cost nearly one-third less than transactions on a Sun 6500 cluster running Oracle's 8i Enterprise Edition database. The Sun/Oracle configuration recorded a TPC-C benchmark of 135,461 transactions per minute.

IT executives swayed by the numbers should know, however, that the total five-year cost of ownership of the tested cluster, including server hardware, software, clients and routing hardware, is more than $14 million.

The cluster package is targeted at data-intensive applications, especially those in the business-to-business, e-commerce and enterprise resource planning areas, the companies said.

"It's extremely robust and will continue to scale," says William Hurley, a program manager at IT analysis firm The Yankee Group in Boston. "It will allow data mining to become more sophisticated."

In February, Microsoft announced its own world-record transaction performance using Win 2000 Advanced Server, SQL Server 7.0 and a cluster of 12 Compaq ProLiant 8500 servers each with eight Intel Pentium III Xeon 550-MHz processors. Using the same TPC-C audit, Microsoft and Compaq recorded 227,079 order transactions per minute.

At the time, the pair said it was greater than any result achieved on any other database, hardware or operating system. Oddly enough, however, the results are not listed in the top 10 of the performance chart posted on the TPC's Web site.

But the IBM results are, and are listed at No. 1. IBM is competing closely with Oracle in the database arena. According to a study by Dataquest released in May, Oracle holds 31.1% of the database software market, compared with 29.9% for IBM.

"I think they're trying to differentiate themselves from Oracle. I know that Oracle does have the upper hand," Hurley says. "Only time will tell, over the next few quarters, if they can cut into their market share."

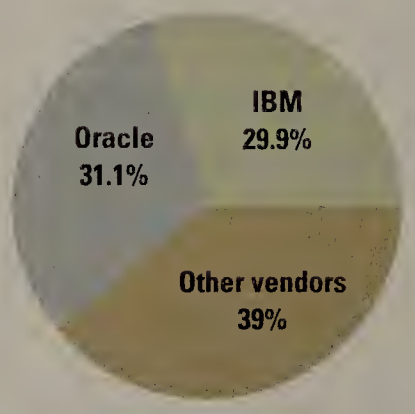
The server cluster software and hardware will be available from all three companies by Dec. 7. Pricing wasn't announced.

IBM: www.ibm.com; Microsoft: www.microsoft.com; Intel: www.intel.com

Database servers

Oracle and IBM are battling it out in a close race for database market dominance.

Worldwide database software market



SOURCE: DATAQUEST, SAN JOSE

Nortel spinoff delivers gig copper wares

Netgear targets small business users with high-speed devices.

BY JIM DUFFY

Netgear, the maker of small office/home office products that spun off from Nortel, has introduced a suite of Gigabit-over-copper gear designed to enable users to inexpensively migrate to Gigabit Ethernet.

Even though larger vendors — such as Cisco, Foundry Networks and Extreme Networks — are now shipping "gig copper" products, Netgear claims small businesses could not upgrade their networks to gigabit speeds without installing expensive fiber optics. Netgear's four new products — targeted specifically at the SOHO market — support Category 5 copper, alleviating the need to pull fiber throughout a small business.

Nortel spun off Netgear earlier this year because SOHO networking was not core to Nortel's business. (www.nwfusion.com, DocFinder: 9032).

As many as 24 million homes in the U.S. will have computer networking by year-end, and the home network market will grow to $1.4 billion by 2003, Netgear CEO Patrick Lo recently told *Network World*.

Netgear's new products include The FS518T Fast Ethernet switch with Gigabit uplinks; the FS510T Fast Ethernet/Gigabit Ethernet switch; the GS504T copper Gigabit switch; and the GA620T Gigabit adapter card.

The FS518T connects client PCs to servers or other workgroups. It has 16 10/100M bit/sec autosensing Ethernet ports for clients and two 100/1000M bit/sec autosensing ports for server and switch uplinks. The FS518T costs $1,995 and is available now.

The FS510T is a lower-density version. It features eight 10/100M bit/sec autosensing ports and two 100/1000M bit/sec uplinks. It also supports RJ-45 connections with Category 5 cable. The FS510T lists for $1,170 and will be available later this summer.

The GS504T serves as an aggregator of up to four FS518Ts or FS510Ts. It features four 100/1000M bit/sec ports with RJ-45 connectors. The GS504T lists for $2,200 and is available now.

The GA620T Gigabit adapter card installs in servers for connection to a Gigabit Ethernet network. It is a 100/1000M bit/sec full-duplex autosensing Ethernet adapter for PCI bus-based systems, and supports drivers for Windows NT and Windows 2000 operating systems.

The GA620T has an RJ-45 Category 5 cable connector. It lists for $465 and is available now.

Netgear: www.Netgear.com

High-Speed LANs
Subscribe to our free newsletter.
DocFinder: 5434

3Com,
continued from page 23

"This really manages the access control problem at the wrong layer. You're managing devices, not users."

The Router 400 sits between wireless LAN clients running Windows 9X or NT and the wired network infrastructure (see graphic, page 23), and can be connected to a Remote Authentication Dial-In User Service (RADIUS) server for user authentication.

According to Bilodeau, wireless users log on to a wired network through the Router 400 and are authenticated to the network through the RADIUS server. Once authenticated, the Router 400 establishes a Layer 3 encrypted tunnel between itself and the client using 128-bit Microsoft Point-to-Point Encryption software, which is inherent in the Windows operating system.

Because the authentication and encryption are based in Level 3, wireless client management is simplified — instead of setting up both user/password and hardware security for wireless clients, access can be set solely on users' network identity.

Michael McPeck, director of respiratory care and biomedical engineering at University Medical Center in Stony Brook, N.Y., was involved in the rollout of his hospital's wireless network of Symbol handheld devices and Citrix thin client software. Although he is not a 3Com user, he applauds any effort to beef up wireless LAN security.

"We're constantly making steps to increase overall security of the entire network," McPeck says. "I think particularly in the healthcare industry we need to consider more stringent measures to keep hackers and information thieves out all the time."

Doctors at Stony Brook use wireless handheld devices to quickly access patient information. McPeck says while there have been no problems with wireless data security so far, he would like to see a higher level of security than the Layer 2, device-level based security the hospital currently has for its wireless network.

The Superstack II Router 400 is compatible with any standard 802.11-based wireless network interface card and access point hardware and will cost around $5,200.

3Com: www.3com.com/wireless/

www.nwfusion.com
WIRELESS WISDOM
3Com outlined its wireless strategy at Telecom '99 in Geneva. Find out about the company's rollout plans.
DocFinder 9031 find it online

e-business

It takes a powerful
database
to analyze and act on
Web data
as fast as customers
can click.

That's the software
IBM makes.

IBM

DB2® Universal Database™ integrates business intelligence capabilities others leave out, helping you consolidate online customer data with everything else that's going on in your business. To see how DB2 helps make all your systems smarter, visit www.ibm.com/software/soul/smarter

Software is the soul of e-business.™

IBM, DB2, DB2 Universal Database, the e-business logo and Software is the soul of e-business are trademarks of International Business Machines Corporation in the United States and/or other countries. © 2000 IBM Corporation. All rights reserved.

Some of the biggest names in the business come to us
for smart networking solutions. We're glad to chip in.

FUJITSU

HITACHI

華爲技術
HUAWEI

Italtel

NEC

OKI

3Com

Motorola, the Stylized M Logo, Heart of Smart, DigitalDNA and the DigitalDNA logo are trademarks of Motorola, Inc. The PowerPC name is a trademark of IBM Corp. and is used under license therefrom. 3Com is a registered trademark of the 3Com Corporation. Nuon is a trademark of VM Labs. All other logos are used by permission and are trademarks or registered trademarks of their respective owners.

Looking for a smart solution for your next-generation router, switch, server, modem, or desktop device? There's only one name to know: DigitalDNA from Motorola. DigitalDNA is chips, systems, software and ideas — embedded solutions that help smart companies create smart products. And you'll find it in leading-edge technology like 0.10µm copper interconnect CMOS-based solutions. The world's fastest copper interconnect SRAMS. And a wide portfolio of highly scalable PowerPC cores. So if you're ready to go big time with your networking or computing design, we're happy to help.

www.digitaldna.motorola.com

Digital DNA™
from Motorola

THE HEART OF SMART™

Wired Windows . Dave Kearns

MESSAGE RETURNED: I AM ON VACATION

At least once per year I try to take a real vacation — no computer, no phone, as little contact with newspapers, television and radio as possible. If something momentous should happen, then someone I'm in contact with will mention it. The downside of this is facing my inbox when I return.

Recently, my wife and I spent 10 days in the relative peace and quiet of Alaska — great weather, gorgeous scenery and fantastic interaction with the geology and biology of this fascinating state — all without the electronic trappings of modern life. It wasn't easy to resist — Internet cafes show up almost as often as drive-through espresso stands in Juneau, Sitka, Ketchikan, Seward, Valdez and Talkeetna — but resist I did.

I'd taken all the precautions possible with my e-mail — setting listserv mailing lists to "nomail" and unsubscribing from others without the nomail option. I'd notified my editors and clients that I'd be away. I'd set up a "vacation message," which would be automatically sent (one time only) to people sending me e-mail during the period I'd be away. Nevertheless, more than 500 e-mail messages awaited me on my return.

One-hundred twenty entries could be attributed to daily digests from news clipping services I use, notes from readers, press releases, and notes from friends or acquaintances. That left more than 75% of the contents of my inbox as things I wasn't expecting, didn't want or had no use for.

One interesting statistic is for approximately 50% of the spam I received there was also an "undeliverable" message returned from my vacation message. Thus, the 200 spam messages ("get rich quick", "get sex now" and "spy on your neighbors" were the top categories) created another 98 "bounce" messages — a good statistic to use when arguing for the blocking of unsolicited e-mail. A less-intelligent e-mail package responds to each incoming message with a vacation message so those 98 bounces would generate even more vacation messages and even more bounces, ad infinitum. The Imail server I use only sends the vacation message once per correspondent.

It only took an hour or so to go through the mail and quickly delete the 400 unneeded/irrelevant/unwanted notes; it will take considerably longer to read, digest and respond to the relevant ones. But that's a small price to pay for 10 days of uninterrupted peace and quiet. Try it, you'll like it!

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

The Imail server I mentioned (from Ipswitch, Inc. — http://wwwipswitch.com/) includes dozens of other very useful features and runs on an NT 4/Windows 2000 platform. Check its price and features for a pleasant surprise.

Yesterday I was just numbers on paper.

Today I am the lifeblood of business.

I am the genetic material

that flows between companies

to create products,

deliver service,

build companies,

enhance life.

And I am forever

committed to commerce.

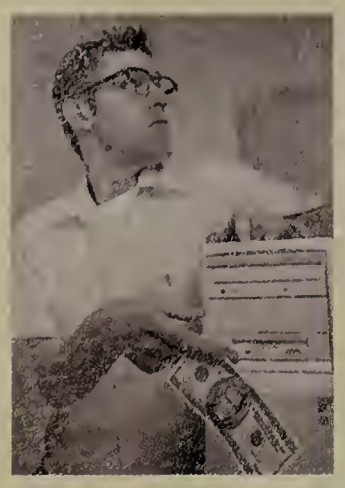
Who is committed to me?

We're investing 6 billion dollars in the most far-reaching deployment of broadband out there. We're one of the largest network integrators, and a provider of advanced, global eCommerce solutions. We're SBC. The combined strengths of Ameritech, Pacific Bell, Southwestern Bell, Nevada Bell, SNET and now Sterling Commerce.

sbc.com

Copyright © 2000 SBC Communications Inc. All rights reserved.

Option 1 *the* **BRIBE**



Sometimes it seems like the only answer; bribe your servers to "cooperate." But once you start paying them off, their greed and jealousy could spiral out of control. The last thing you want is an angry mob of servers on the extortion tip. If you want control with no strings attached, see option 3.

Option 2 *the* **THREAT**

Nothing gets attention like the promise of physical harm. But if you take the tough-guy approach, you'd better be ready to back it up. If a server thinks you're bluffing, it might lash out like a cornered rat. Without total control of all your servers at a glance, this is a dangerous game indeed.

If your servers

WON'T LISTEN

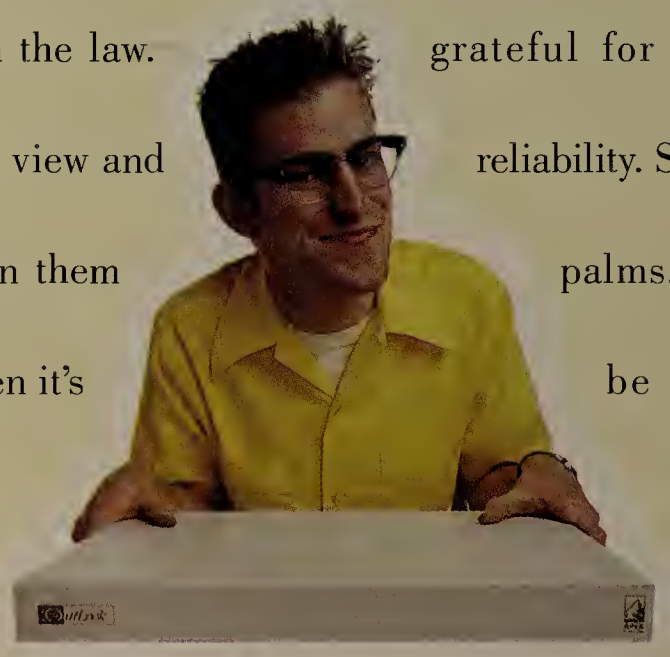
to negotiation and diplomacy,

IT'S TIME TO PLAY

HARDBALL!

Option 3 *the* **SERVER CONSOLE SWITCH**

The smart play of course, is to bring in the law. Apex OutLook® console switches let you view and manage multiple servers, toggle between them easily, and even access your network when it's down. You'll save steps to the server room, save space, and be eternally grateful for their ease-of-use and unmatched reliability. So instead of twisting arms and greasing palms, use some smarts. Your servers will be standing in line to pay respects. Badda bing, badda boom.



www.apex.com/outlook/

APEX

Run your **SERVERS** *smarter.*

COPYRIGHT © 2000 APEX INC ALL RIGHTS RESERVED

Briefs

Bill Gates is sinking another $100 million into his cherished Internet-in-the-sky venture, helping restore confidence in the next-generation satellite business. The software mogul last week joined several international venture capitalists in providing a total of $1 billion of new equity in **ICO-Teledesic Global,** the holding company for the satellite ventures of wireless pioneer **Craig McCaw.** The holding company controls the successor to **ICO Global Communications,** a satellite voice and third-generation wireless company that emerged from Chapter 11 bankruptcy in May. It also controls **Teledesic,** a broadband IP satellite data network that Gates helped found in 1994 and is projected to begin service in 2004. The satellite business has been seeking a jolt of confidence since global calling and paging pioneer **Iridium** failed last year.

DSL service provider **Flashcom** is buying **Axcelerant Group** to add information systems services to its high-speed access business. Rather than providing connections to the Internet or other public networks, Flashcom will offer services such as managed teleworking, videoconferencing and setting up VPNs with business partners. Axcelerant's portfolio also includes network-security consulting.

Flashcom: www.flashcom.com

PSINet named **Lawrence Hyatt** chief financial officer and executive vice president last week. Hyatt takes over the executive financial reins several months after the ISP's previous CFO, **Ed Postal,** left the company to work for Cidera, a content distribution service provider. PSINet's new CFO has 20 years of experience with Marriott.

PSINet: www.psi.net

Genuity bolsters service guarantees

Former GTE Internetworking improves SLAs covering availability, latency.

BY DENISE PAPPALARDO

BURLINGTON, MASS. — Genuity is jazzing up its dedicated Internet access service-level agreements this week.

Formerly known as GTE Internetworking, the ISP is offering business customers stronger guarantees in the areas of network availability, latency and packet loss.

"The enhancements offer our customers a comprehensive performance standard," says Susan Hartman, senior product manager for Internet Advantage, Genuity's dedicated Internet access services.

Genuity has been offering customers a network availability guarantee, but the SLA did not include the local-loop portion of a user's connection to the Internet. Now Genuity is guaranteeing availability on Internet Advantage customers' local-loop connections, but only if that link was ordered through Genuity.

If Genuity's network or a customer's local-loop connection is unavailable for 10 minutes or more in any given instance, the ISP will refund the customer a one-day service credit. If the networks are unavailable for 60 minutes or more, Genuity will refund a three-day service credit. This SLA also applies to Genuity's international customers.

www.nwfusion.com

FINDING YOUR SERVICE LEVEL

Find out more about Genuity's SLAs

White paper: Service-level management for executives.

Report: SLAs — An emerging trend in the Internet services market.

DocFinder 9033

find it online

Genuity is also reinforcing its round-trip latency guarantee. The ISP is guaranteeing that customer's traffic will traverse Genuity's network in 65 msec or less. Genuity's previous SLA guaranteed 75 msec or less. Earlier this year, Cable & Wireless was one of the first ISPs to offer a round-trip minimum latency guarantee of 70 msec or less, but now Genuity upped the ante with its new SLA.

Genuity's guarantee is also available to European customers, but only for traffic that travels between its 10 points of presence in Europe. For traffic that travels between the U.S. and Europe, Genuity is guaranteeing a 110-msec or better round-trip guarantee.

The ISP has also beefed up its packet loss SLA. Genuity was guaranteeing it would not drop more than 10% of packets on average, per month, but now has improved the guarantee to not drop more than 1%. This guarantee also applies to Genuity's international customers.

If Genuity doesn't live up to its latency or packet-loss SLAs, the ISP will refund customers a one-day service credit.

But the compensation for Genuity's SLAs are reactive, meaning a customer must notice and report the failure to receive the credit.

Genuity's Hartman says the ISP is moving to a more proactive model, but such a system is not yet available.

Genuity: www.genuity.com

Netopia bonds DSL lines for faster connections

BY TIM GREENE

ALAMEDA, CALIF. — Netopia has an easier way for service providers to give DSL customers a fast link to the Internet and corporate intranets.

The company is introducing multilink PPP (MLPPP) support for its customer-site DSL routers, making it possible to turn up to four DSL lines into a single logical connection.

The feature is available now for ISDN-based DSL (IDSL) connections, giving customers the ability to create a 576K bit/sec link. An IDSL line can handle 144K bit/sec.

This new capability makes it easier for ISPs and other carriers to deliver higher-bandwidth DSL services to end users, says Harold Anthony, product marketing manager for Florida Digital, an Orlando ISP that has tested and plans to use MLPPP to support new services.

A Netopia R-Series router at a customer site is the starting point for bonding four individual DSL lines into one 576K bit/sec link.

Rather than calling for a DSL Access Multiplexer (DSLAM) that can bond two DSL lines between a customer site and a carrier network, MLPPP bonds them at the customer site and any MLPPP-enabled router. For example, an ISP such as Florida Digital can install an MLPPP DSL router at a customer site, connect multiple DSL lines to it and bond them together at a Florida Digital point of presence.

The customer traffic travels through the local phone company network to get to the Florida Digital POP, but no bonding equipment is necessary in the local carrier's network. This makes it much easier to set up a DSL bonded service for customers, Anthony says.

By avoiding use of a DSLAM, MLPPP makes it possible to supply larger connections to sites served by remote phone company terminals that are too small to house DSLAMs. In some areas, that is more than half the customers served by the phone company.

Bonding is available on Netopia's R-Series routers and requires a firmware upgrade to existing models. Later this year, Netopia will introduce bonding for symmetric and asymmetric DSL routers.

Netopia: www.netopia.com

Eye on the carriers . David Rohde

AT&T'S CIRCUIT-SWITCHING DILEMMA

Some time ago AT&T Chairman C. Michael Armstrong created a buzz by saying AT&T would no longer invest in new circuit switches.

This statement, often repeated by other AT&T officials, was a verbal sleight of hand that reveals much about the carrier's challenges.

No one wants to be left behind in the explosion of packet-switched traffic. But it would be truly amazing if AT&T — which carries up to 300 million phone calls per day — really stopped investing in circuit-switched architecture. That would be like Ford saying it's no longer building cars because trucks are hot.

What Armstrong really meant is that AT&T is not installing any more of its classic switching platform that anchors its long-distance network. This switch, called the 4ESS, was originated by what is now Lucent as the workhorse of the AT&T network. Some 145 of these big boxes direct circuit-switched traffic around the country, and AT&T can evidently manage its growth in calling volume via increased port density, adjunct processors and the like.

But Lucent has other circuit-switching products for carriers, and still others that provide both circuit- and packet-switching capability. While Armstrong can claim that AT&T isn't buying any more exclusively circuit-switching platforms, there's more to the story.

AT&T is now also a local carrier with a need for a local telephone switch like Lucent's 5ESS. As it happens, AT&T has chosen to install Lucent's follow-on to the 5ESS called the 7 R/E, which can take classic circuit-switched traffic but also has interfaces that support voice over IP and ATM.

Something similar is going on in AT&T's relationship with Nortel Networks, which came to fruition after AT&T spun off Lucent and opened itself up to multiple vendors. Many big carriers use Nortel's DMS 100 and DMS 250 — classic circuit switches for local and long-distance traffic. AT&T has decided to buy Nortel's follow-on DMS 500, which combines local and long-distance circuit and packet switching in a single migration-path-friendly platform.

Far from not investing in these switches, AT&T is behind the eight ball to get more of them into its network as it promotes local service to business and, increasingly, residential customers.

Frank Ianna, president of AT&T network services, says the company is installing 40 Lucent 7 R/E and Nortel DMS 500 switches this year. Ianna makes the point that many new carriers stop short of pitching directly to enterprises precisely because it might mean putting in this kind of diverse, hybrid network.

That may protect AT&T's position as the leading legacy carrier, but it's also why the investment mix at AT&T is so complex. No matter how its CEO spins the story, AT&T can't divert — and isn't diverting — all of its capital spending to a critically needed next-generation IP network with hosting, caching and content-distribution capabilities and broadband local access. If AT&T ever separates the legacy business from its data, Internet and cable ventures, this will be a large reason why.

Rohde is managing editor of The Edge section of Network World. *He can be reached at drohde@nww.com.*

What's in a name?

Firewalls, virtual private networks, and intrusion detection systems are all important pieces of Internet security. But those pieces alone won't bring you peace of mind.

Internet Security Systems offers total security solutions, combining years of award-winning technology leadership, world-class consulting and educational services, comprehensive managed security services, and sensible e-business liability protection from our insurance industry partners.

That's why over 5,500 customers worldwide, including 21 of the 25 top U.S. banks, the top 10 U.S. telecommunications companies, and over 35 government agencies look to Internet Security Systems as their trusted security partner.

So, what's in a name? Possibly everything.

INTERNET SECURITY SYSTEMS

www.iss.net • 1-800-776-2362

©2000 Internet Security Systems, Inc. All Rights Reserved. Internet Security Systems is a trademark of Internet Security Systems, Inc.

NetworkWorld

FREE Subscription Application!

☐ **YES** I want to receive/continue to receive my FREE subscription to *Network World.* No, thank you. ☐

Sign Here

Signature (required) Date

TO QUALIFY: You must supply your company name and address. If military, please specify branch/base. If government, please specify division.

Name Title

Company

Division/Mail Stop/Military Branch or Base

Street Address

City State Zip

Business phone (____) _____ FAX (____) _____

Internet E-mail address _____

We would like to send you periodic information via e-mail on 3rd party networking products/services.

☐ Check here if you DO NOT wish to receive this information.

If there is a parent company, please provide name: _____

☐ My home address is also my business address.

Optional delivery address: Enter your home address below if your company will not accept delivery at your business address:

Street Address City State Zip

Publisher reserves the right to serve only those individuals who meet publication qualifications. ALL questions must be answered. Incomplete forms will not be processed. Free subscriptions available to qualified US applicants. International rates available upon request.

B700

1. What is the principal business activity at your location? (check ONE only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities/Process Industries/Mining, Construction, Petroleum, Refining, Agriculture, Forestry
10. ☐ Education
11. ☐ Government/Military/Aerospace
12. ☐ Consulting (Independent) *
13. ☐ Communications Carriers
14. ☐ ISP
15. ☐ ASP
16. ☐ Manufacturing (Computer/ Communications/OEM)
17. ☐ Resellers/VARs/VADs/Integrators/ Distributors* (Computers/Communications)*
18. ☐ Other (please specify) _____

*Attn Consultants, Integrators, Distributors, Resellers: Please complete form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only) S: What is your secondary job function? (check ALL that apply)

P	S		P	S		P	S	
☐	☐	1. Network Management	☐	☐	5. Internet/Intranet/ E-Commerce Management	☐	☐	8. Consultant (Independent)
☐	☐	2. LAN Management	☐	☐	6. Engineering Management	☐	☐	9. Other (please specify) _____
☐	☐	3. Datacom/Telecom Management	☐	☐	7. Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)			
☐	☐	4. CIO/CTO/IS/IT/MIS/ Systems Management						

3. What is the estimated value of Network equipment and services that you specify, recommend, or approve the purchase of?

(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–O.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 Million to $24.9 Million
5. $1 Million to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A ____ Large Systems *(Mainframes/Minis)*
B ____ Desktops *(Micros/Laptops/Workstations)*
C ____ Mobile *(including PDAs, Wireless)*
D ____ Servers
E ____ LANs
F ____ WAN Equipment
G ____ Carrier Services
H ____ Internetworking *(including Routers, Switches)*
I ____ Internet/Web/E-commerce
J ____ Intranet/Extranet
K ____ Remote Access
L ____ Peripherals
M ____ Software
N ____ Services/Support
O ____ Storage

4. What is the total number of sites for which you have purchase influence? (check ONE only)

1. ☐ 100+ 2. ☐ 50 to 99 3. ☐ 20 to 49 4. ☐ 10 to 19 5. ☐ 2 to 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization? (check ONE box in each column)

SERVERS			CLIENTS			LANs		
At Location		Entire Org.	At Location		Entire Org.	At Location		Entire Org.
A		B	C		D	E		F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

CORPORATE:
1. ☐ Entire Enterprise/Multiple Enterprises
2. ☐ Division/Multiple Divisions
3. ☐ Department
4. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network/IT Strategy
2. ☐ Recommend/Specify Brand
3. ☐ Approve Purchase
4. ☐ Evaluate Products/Services
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization? (check ONE in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 100 – 249
9. ☐ 99 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

8. Please indicate the Internet/Intranet/WAN/LAN/Remote products/services that you are currently involved in purchasing or plan to purchase (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

INTERNET/INTRANET

A	B		A	B		A	B	
☐	☐	01. VPN Equipment	☐	☐	07. Web Hosting	☐	☐	13. Web Based Collaboration/ Groupware
☐	☐	02. VPN Services	☐	☐	08. Content Hosting	☐	☐	14. Web Acceleration/Caching/ Load Balancing Products
☐	☐	03. Firewalls/Security/Encryption	☐	☐	09. Traffic Management			
☐	☐	04. Electronic Commerce Tools	☐	☐	10. Web Development Tools	☐	☐	15. Other Internet/Intranet
☐	☐	05. Web Servers/Software	☐	☐	11. Management/Monitoring Software			
☐	☐	06. Internet Services	☐	☐	12. Web Based Management Tools			

LANs/INTERNETWORKING

A	B		A	B		A	B	
☐	☐	16. Local-Area Networks	☐	☐	26. Layer 4-7 Switches	☐	☐	34. Hubs/Intelligent Hubs/ Stackable Hubs
☐	☐	17. Network Operating System Software (NOS)	☐	☐	27. ATM Switches	☐	☐	35. Cables,Connectors, Baluns
			☐	☐	28. Token-Ring Switches	☐	☐	36. Management Frameworks
☐	☐	18. Intel Based Servers	☐	☐	29. Network Storage (NAS, SANs)	☐	☐	37. Call Center Tools
☐	☐	19. Intel Based Multiprocessor Servers	☐	☐	30. Storage/Backup (Optical, Disk, Tape, RAID)	☐	☐	38. Voice over LAN
☐	☐	20. RISC Based Servers				☐	☐	39. Other Local-Area Network/ Internetworking
☐	☐	21. Clustered Servers	☐	☐	31. Network Test/Diagnostic Tools			
☐	☐	22. Print Servers	☐	☐	32. UPS			
☐	☐	23. Routers	☐	☐	33. Network Interface Cards (NICs, PCMCIA)			
☐	☐	24. Layer 2 Switches						
☐	☐	25. Layer 3 Switches						

REMOTE/WIRELESS

A	B		A	B		A	B	
☐	☐	40. PDAs	☐	☐	42. Remote Access Services	☐	☐	44. Other Remote/Wireless
☐	☐	41. Remote Access Products	☐	☐	43. Wireless Data Equipment/Services			

WAN EQUIPMENT & SERVICES

A	B		A	B		A	B	
☐	☐	45. Modems	☐	☐	51. FT-1/T-1/T-3 Services	☐	☐	58. Managed LAN/Router Services
☐	☐	46. Cable Modems	☐	☐	52. xDSL Services/Products	☐	☐	59. Fax Servers/Services
☐	☐	47. Asynchronous Transfer Mode (ATM)	☐	☐	53. Diagnostic/Test Equipment	☐	☐	60. Other WAN Equipment/Services
☐	☐	48. Frame Relay Equipment including FRADS	☐	☐	54. DSU/CSU			A B
			☐	☐	55. PBXs			None of the above (1 – 60) ☐ ☐ 61.
☐	☐	49. Frame Relay Services	☐	☐	56. Voice/Video over IP Gateways			
☐	☐	50. ISDN Equipment/Services	☐	☐	57. Videoconferencing			

9. Please indicate the Network hardware/software/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

SYSTEMS/PERIPHERALS

A	B		A	B		A	B	
☐	☐	01. Laptops/Notebooks	☐	☐	05. Storage/Backup (Optical,Disk,Tape,RAID)	☐	☐	08. Minis
☐	☐	02. PCs				☐	☐	09. Mainframes
☐	☐	03. Windows Terminals/Thin Clients	☐	☐	06. Printers	☐	☐	10. Fax/Modem Boards
☐	☐	04. Workstations	☐	☐	07. Printer/Fax/Copier Hybrids (Multifunction Printers)	☐	☐	11. Memory/Chips/Boards/Cards
						☐	☐	12. Other Computers/Peripherals

SOFTWARE/APPLICATIONS

A	B		A	B		A	B	
☐	☐	13. Network Management (incl. SNMP)	☐	☐	20. Groupware	☐	☐	27. Document Management
☐	☐	14. Systems Management	☐	☐	21. E-Mail	☐	☐	28. Site Metering Tools
☐	☐	15. Security	☐	☐	22. Enterprise Resource Planning (ERP)	☐	☐	29. Data Warehousing
☐	☐	16. Directory Services				☐	☐	30. Anti Virus Software
☐	☐	17. Operating Systems	☐	☐	23. EDI	☐	☐	31. Multimedia
☐	☐	18. Applications Development Tools	☐	☐	24. Desktop Videoconferencing	☐	☐	32. Helpdesk
☐	☐	19. Database Management/RDBMS	☐	☐	25. Imaging	☐	☐	33. Other Software/Applications
			☐	☐	26. Middleware/Serverware			

SERVICES

A	B		A	B		A	B	
☐	☐	34. BPO (Business Process Outsourcing incl. Financial Services, HR, Logistics, etc.)	☐	☐	35. ASP Services	☐	☐	38. Education/Training Services
			☐	☐	36. Call Center Outsourcing	☐	☐	39. Other Services
			☐	☐	37. Systems Integration/Consulting	A	B	None of the above (1 – 39) ☐ ☐ 40.

10. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently Installed B. Planned for purchase

NETWORK PROTOCOLS

A	B		A	B		A	B	
☐	☐	01. TCP/IP	☐	☐	05. APPC/APPN/LU 6.2	☐	☐	09. HTTP
☐	☐	02. IPV6	☐	☐	06. NETBIOS/NETBUEI	☐	☐	10. Other Network Protocols
☐	☐	03. SNA	☐	☐	07. NFS			
☐	☐	04. Novell IPX/SPX	☐	☐	08. SNMP			

LAN/WAN ENVIRONMENT

A	B		A	B		A	B	
☐	☐	11. Gigabit Ethernet	☐	☐	17. Layer 3,4 Switching	☐	☐	23. DSL
☐	☐	12. Switched Ethernet	☐	☐	18. FDDI	☐	☐	24. ISDN
☐	☐	13. Fast Ethernet	☐	☐	19. 100Base-T	☐	☐	25. Frame Relay
☐	☐	14. Ethernet	☐	☐	20. 10Base-T	☐	☐	26. Private Line T1, T3, FT-1, SONET
☐	☐	15. ATM	☐	☐	21. Fibre Channel	☐	☐	27. Other LAN/WAN Environment
☐	☐	16. Token Ring/Token Ring Switching	☐	☐	22. Wireless LANs			

NETWORK OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	28. Windows NT/Windows 2000	☐	☐	31. Novell (NetWare 2.X,3.X)	☐	☐	34. Banyan (Vines)
☐	☐	29. Novell (NetWare 5.X)	☐	☐	32. LINUX	☐	☐	35. IBM (LAN Server)
☐	☐	30. Novell (NetWare 4.X)	☐	☐	33. Microsoft (LAN Manager)	☐	☐	36. Other Network Operating System

COMPUTER OPERATING SYSTEM

A	B		A	B		A	B	
☐	☐	37. NT Workstation	☐	☐	42. LINUX	☐	☐	47. Digital VMS
☐	☐	38. Windows 2000	☐	☐	43. DOS	☐	☐	48. Macintosh
☐	☐	39. Windows 98/95/3.1	☐	☐	44. OS/2,OS/2 WARP	☐	☐	49. Other Computer Operating System
☐	☐	40. Intel based UNIX	☐	☐	45. OS/400			A B
☐	☐	41. RISC based UNIX (incl. SOLARIS)	☐	☐	46. IBM MVS/VM/VSE/ESA			None of the above (1– 49) ☐ ☐ 50.

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale)
1. ☐ IBM
2. ☐ Other

B - Minis (Midrange)
1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital/Tandem/Compaq
4. ☐ Unisys
5. ☐ H-P
6. ☐ Other

C - Workstations
1. ☐ Sun Microsystems
2. ☐ H-P
3. ☐ Digital/Compaq
4. ☐ IBM
5. ☐ Silicon Graphics
6. ☐ Other

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. ☐ $20 Billion or More
2. ☐ $10 Billion to $19.9 Billion
3. ☐ $1 Billion to $9.9 Billion
4. ☐ $500 Million to $999.9 Million
5. ☐ $100 Million to $499.9 Million
6. ☐ $50 Million to $99.9 Million
7. ☐ $10 Million to $49.9 Million
8. ☐ $5 Million to $9.9 Million
9. ☐ $4.9 Million or Less
10. ☐ None of the above

13. For which areas outside of the U.S.A. do you have purchase influence? (check ALL that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ Africa
7. ☐ Canada
8. ☐ None

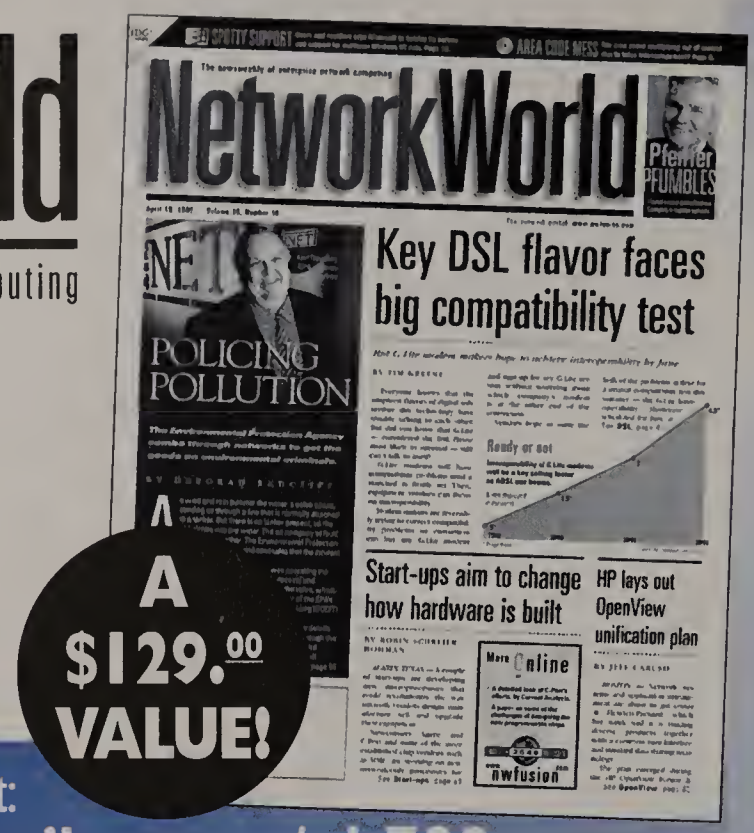
FORM: 0001

NetworkWorld

The newsweekly of enterprise network computing

Apply for your FREE subscription to Network World today! Simply follow these three easy steps:

1. Answer ALL the questions
2. Sign and date the form
3. Mail today!



For faster service, subscribe online at:
http://www.nwwsubscribe.com/nb700

EACH QUALIFIED SUBSCRIPTION INCLUDES:

- 51 FREE issues of Network World
- 6 Signature Series special issues on key industry players and trends
- Product reviews, buyers guides, technology updates, management surveys and more!

▼ 1. FOLD HERE & MAIL TODAY ▼

Would you like to receive Netflash Daily – *Network World's* **FREE daily e-mail digest of top networking news? YES** ☐ **NO** ☐ **Your E-Mail Address**_____

Your colleagues may also qualify for a FREE subscription!

Please list below names and job functions of other individuals at your location who might also benefit from a FREE subscription to NetworkWorld

NAME _____ JOB FUNCTION _____ E-MAIL ADDRESS _____

NAME _____ JOB FUNCTION _____ E-MAIL ADDRESS _____

NAME _____ JOB FUNCTION _____ E-MAIL ADDRESS _____

NAME _____ JOB FUNCTION _____ E-MAIL ADDRESS _____

NAME _____ JOB FUNCTION _____ E-MAIL ADDRESS _____

▼ 2. FOLD HERE & MAIL TODAY ▼

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO 1752 NORTHBROOK IL

POSTAGE WILL BE PAID BY ADDRESSEE

NetworkWorld
PO BOX 3091
NORTHBROOK IL 60065-9928

Briefs

SoftQuad Software has shipped XMetal 2.0, a Web content creation tool for editing documents based on XML. XMetal 2.0, which costs $495, adds support for the database access technology, Open Database Connectivity, which will let users convert data stored in Oracle and Microsoft into XML documents.

SoftQuad: www.softquad.com

Sybase and Ericsson last week announced a global partnership to deliver mobile banking applications on Ericsson phones. The applications will be based on the Wireless Application Protocol and Sybase's iAnywhere Wireless Server software. The applications will run on Ericsson mobile phones using Symbian's EPOC operating system. Citibank has already expressed interest in the product combination, the firms say.

Sybase: www.sybase.com; Ericsson: www.ericsson.com

3Com this week will announce the latest version of its Transcend network management software aimed at large enterprise nets.

Transcend Network Supervisor 2.0 will let users map, monitor and remotely configure up to 1,500 devices on a net. New features include support for managing 3Com's NBX IP telephony switches and phones as well as a feature to download network configuration data to users' Palm Pilots.

The software also includes network stress monitoring capabilities and an automatic alert system which can be configured to send e-mail or page network staff if a system failure or heavy network congestion occurs.

The software will be available in August free at www.3com.com/tns and will ship with all new 3Com managed switches and hubs.

3Com: www.3Com.com

Software manages Web content

Worldweb.net package tracks content, eases workflow routines.

BY CAROLYN DUFFY MARSAN

As the number and kinds of Web-enabled devices increase, Web publishers are faced with the challenge of serving content to the tiny screens of cell phones, Palm and Blackberry gadgets as well as full-sized computer monitors. Enter Worldweb.net, a provider of Web content management offerings that recently started shipping software to automate this process.

Worldweb.net's Expressroom I/O is a platform for creating, managing, deploying and delivering Web content. Based on XML and Java, Expressroom I/O consists of client and server software as well as a layer of middleware. The system lets users import and check out content, track authorizations for accessing and changing content, maintain the latest versions of content, handle workflow and prepare content for delivery.

At the end of June, Worldweb.net began shipping a version of the software that supports the Wireless Markup Language (WML) for delivering content to mobile devices. Because it uses XML at its core, Expressroom I/O requires end users to tag categories of information as they create it. Designers can then build different templates for desktop, handheld and cell phone systems and pick which categories of information they want to display on each type of system. The software automatically converts the information from XML to WML for the wireless devices.

"The author can create an article that can be poured into different templates without the author doing anything," says Brian Loew, president of Worldweb.net. "We can simultaneously deliver the same content to different templates and different devices. From the author's or editor's perspective, it just happens."

Industry analysts say Worldweb.net's XML architecture is an advantage in the shift to wireless Web access.

"If you have XML at your core, it's a much more streamlined process to get information out to wireless devices," says Leonor Ciarlone, a senior consultant with the Dynamic Content Software Strategies group at Cap Ventures in Norwell, Mass. "It's all a question of time to market and making it easy for your customers . . . in terms of how fast they can get to WML."

The first company to test Worldweb.net's WML support was *George Magazine*, which created its georgemag.com Web site using Expressroom I/O. *George Magazine* is planning to launch a headline news service that will deliver election results to Web-enabled cell phones.

Worldweb.net's competitors include Interwoven and Vignette, which also offer WML support. However, neither of these companies converts information directly

See **Worldweb.net**, page 38

PROFILE: WORLDWEB.NET

Based:	Alexandria, Va.
Founded:	1994
Product:	Expressroom I/O client and server software for Web content management.
Financials:	Raised $23 million in venture capital funding
CEO:	Brian Loew
Strategic partnerships:	Kinecta, Rare Medium
Fun fact:	In the past six months, the company's revenue from the sale of systems integrators increased by 50%.

Microsoft set to release NetWare integration tools

BY JOHN FONTANA

Just one month after releasing a set of tools to integrate Unix with Windows 2000, Microsoft is getting ready to ship similar tools for Novell's NetWare.

With Services for NetWare 5.0 (SFN5), Microsoft is offering tools to synchronize user account information between Novell's Novell Directory Services (NDS) and Microsoft's Active Directory. The package also includes file migration, and file and print server migration support.

The tools are designed to foster interoperability between the two directories and for migration from NetWare to Win 2000. Microsoft's immediate target is the roughly 30% of NetWare users who are on Version 3 of that software. Novell has announced it will cancel support for versions lower than 3.12 by year-end.

See **Migration Tools**, page 38

Integration station

At the end of this month, Microsoft will ship Services for NetWare 5.0, which is designed to help IT executives integrate Novell's Novell Directory Services and Microsoft's Active Directory.

Tools	Description
MSDSS	Integrates user management between Novell, Microsoft directories.
Password Reset Utility	Synchronizes passwords in real time.
Directory Service Manager	Manages NetWare 2.x and 3.x binderies, and Windows NT 4.0.
File Migration Utility	Preserves access control when migrating NetWare files to Win 2000.
File and Print Services	Puts NetWare interface on services using a Win 2000 back end.

Adding biometric authentication to NetWare

Novell's Modular Authentication Services integrate strong security measures into existing NetWare nets.

BY PAUL FERRILL

With a seemingly endless stream of Internet virus attacks and highly publicized security breaches, security concerns are paramount for enterprise network managers. And most companies fear attacks more from inside the firewall than outside.

Stringent password policies coupled with diligent auditing will certainly help, but for many organizations that's just not enough. New developments in biometric devices offer an extra measure of protection but also bring an added administrative burden.

Novell has tossed its hat into the enhanced security fray with the introduction of its Novell Modular Authentication Services (NMAS) product. NMAS works with Novell Directory Services (NDS) to augment normal user-authentication and system-resource access processes. NMAS supports a variety of biometric devices, smart cards and token generators. It uses graded, or multilevel, authentication to establish access rights based on administrator-defined authentication sequences.

While the product is a bit tedious to install and administer, if you are looking to take these extra security measures in your NetWare environment, NMAS certainly can help you secure your network.

Before you install NMAS you'll want to read the documentation and make sure you have all the required system software versions in place. Minimum requirements include NetWare 5.0 or later (Support Pack 4 for NetWare 5.0 must be installed), NDS eDirectory Upgrade for NetWare 5.0, ConsoleOne 1.2c on the NMAS server, Version 1.5.3 or later of the Novell International Cryptographic Infrastructure (NICI) software and Novell Certificate Server 2.0.2 or later. All of the required updates are included on the NMAS CD.

Any workstation that will use the NMAS client software must be a Pentium Pro 200-MHz or better with 64M bytes of memory running Windows 95 Release B or later, Windows 98, Windows NT 4.0 with Service Pack 3 or later or Windows 2000.

One annoyance during our installation occurred when we tried to update the NICI software from the NMAS CD and found it was an export (56-bit) version. The installer wouldn't let us go from an older strong encryption version to a newer, weaker version. To fix the problem, we downloaded the strong version from Novell's Web site.

During the installation, we ran into several problems that turned out to be a hardware failure of our 10/100M bit/sec Ethernet switch. When we changed the switch and reran the NMAS server install, we realized the previous attempt never completely installed but didn't give any indication of a problem. Novell is using a new Java-based install program with this product and acknowledged there's work to be done in the error checking and recovery department.

Another nuisance we discovered is that once you install NMAS, it will, by default, no longer pass the Novell user name/password pair on to a Windows 95 or 98 client. That means you'll have to type your password in again unless you change the client setting. To do this, you must right-click on the big red "N" in the system tray and select Novell Client Properties. Then choose the location profiles tab, select the default profile, and click on the properties button. This opens another dialog box where you must again click on the properties button. Finally, a Novell logon dialog box with multiple tabs appears. Select the credentials tab and check the enable password box to have NMAS send the NetWare password on to the Windows client.

Each workstation that uses one of the alternate authentication methods must have the NMAS client software and appropriate client logon method components installed. It must also have the latest NetWare client software installed.

Configuring individual users to use the different logon methods can be a tedious process. First, you must assign each user to a specific logon method. If you're using the fingerprint method you must also enroll each user's fingerprint, although this can be done the first time they log on. Next, you establish clearance levels that the user will be allowed to select using combinations of password, token and biometric. Finally, you must establish the trustee assignments based on a clearance level.

Establishing the proper clearances and logon sequences for a group of users requires you to select each user individually and make appropriate changes. With this release of the NMAS module for ConsoleOne, there's no way to make those kinds of changes in bulk. It is possible to let users register their fingerprint the next time they logon and to set their default logon, but assigning clearances and giving multiple users access to resources with NMAS protection must be done manually.

Once we got everything installed and configured, the system worked as advertised. We were able to access resources depending on what method we used to log on.

We created a new user and assigned a biometric setting plus a password as the primary logon method. We then added the user to the "sales" volume access list when using the sales logon sequence. We also added the user to the access list for a volume named "research" when using the research logon sequence. To verify the access controls, we logged on using each sequence and confirmed the user could only access the proper volume based on the logon sequence used.

Novell offers users a handy way to change logon methods. The normal NetWare logon screen has an advanced tab for displaying things like NDS Tree, context or preferred server. With NMAS there's a new tab that lets you select which logon sequence you'd like to use. A browse button brings up a list box showing all the available methods for you to choose. The next time you log on it will remember your last method and use the same one unless you change it.

As for the documentation, it is a fairly short book with just the bare necessities. It's enough to get you started but not much more.

Stronger security methods have become essential for many organizations. Novell's NMAS solution works specifically in a NetWare environment where you are authenticating to a NetWare server. While NMAS is a little tedious to install and configure, it definitely provides an extra level of security you don't get with standard NetWare.

Ferrill is a principal engineer for Avionics Test and Analysis at Edwards Air Force Base, Calif. He can be reached at pferrill@fwb.gulf.net.

How We Did It

We installed the Novell Modular Authentication Services (NMAS) software on a network consisting of a NetWare 5.1 server running on a Compaq Proliant 5500R with dual 550-MHz Xeon processors and 512M bytes of memory. The server had one 9G-byte disk with a single SYS volume and second 9G-byte disk split into four volumes.

The client system was a Pentium 400-MHz class machine with 128M bytes of memory running Windows 98. We installed the NMAS client software to this machine along with the latest NetWare client from Novell. We then attached the Keytronic fingerprint scanner to the parallel port of the workstation.

To test the overall functionality of the product, we established several users and tried to log on with the wrong set of credentials to see what would happen. We then attempted to access restricted volumes with a nonauthorized user. From an administration perspective, we looked at establishing multiple rights for 100 users to measure the amount of time required and the level of difficulty. We also looked at the auditing and reporting of security events.

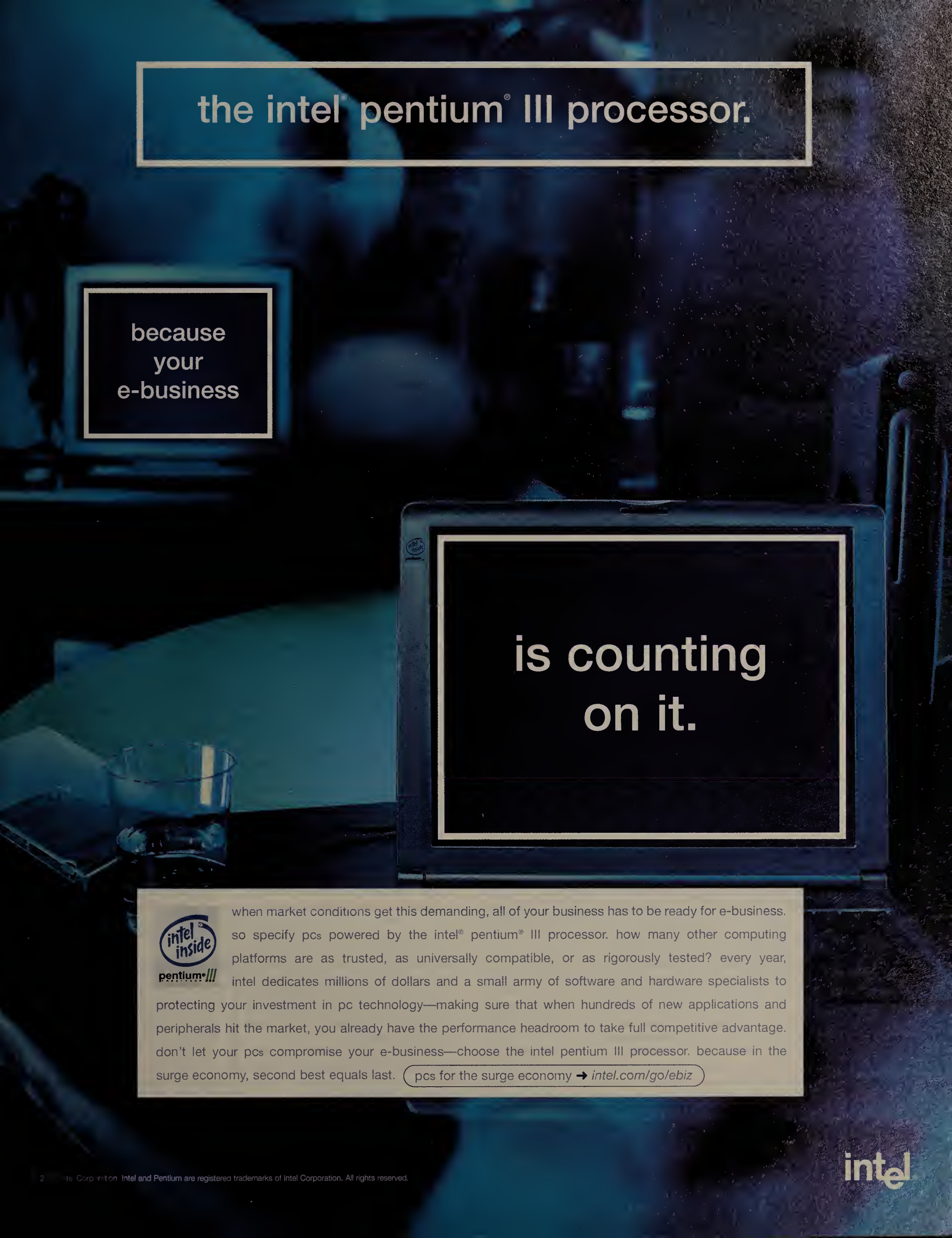
NetResults

Novell Modular Authentication Services Version 1.0

RATING: 6.65 **COMPANY:** Novell, (800) 638 9273, www.novell.com. **COST:** $49 per user. **PROS:** Strong multilevel authentication with support for a wide variety of devices. **CONS:** Tedious to install and configure. Extra layer of management required to set up clearance levels and access rights..

	Functionality 30%	Ease of use 30%	Administration 20%	Installation 15%	Documentation 5%	Total score
NMAS	8	8	4	5	6	6.65

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**



when market conditions get this demanding, all of your business has to be ready for e-business. so specify pcs powered by the intel® pentium® III processor. how many other computing platforms are as trusted, as universally compatible, or as rigorously tested? every year, intel dedicates millions of dollars and a small army of software and hardware specialists to protecting your investment in pc technology—making sure that when hundreds of new applications and peripherals hit the market, you already have the performance headroom to take full competitive advantage. don't let your pcs compromise your e-business—choose the intel pentium III processor. because in the surge economy, second best equals last. pcs for the surge economy ➜ *intel.com/go/ebiz*

2 te Corp r t on Intel and Pentium are registered trademarks of Intel Corporation. All rights reserved.

'Net Insider . Scott Bradner

LAMENTING THE DOT-COMS

Dot-coms seem to be dropping like flies, and those that have not died yet will soon as they run out of their venture capital. The popular press seems to be writing off the whole concept and even PBS's "News Hour With Jim Lehrer" had a segment entitled "Dot-com failure" lamenting the fate of the consumer e-commerce revolution.

But it seems the lamenting is premature and many of the failures are the result of aggressive daydreaming.

It was not that long ago that venture capitalists were throwing money at and the trade press was drooling over just about any start-up that was going to sell stuff or services to customers over the Internet. Wall Street seemed to think shopping malls were about to close down. That is the only explanation of the relative valuations that were given to physical and virtual stores.

But in the last few months the same pundits that told everyone to bet the farm on the future of business-to-consumer e-commerce are now saying "nevermind."

The fate of some start-ups should have been very easy to predict. It should not have been hard to guess that any company that decided to spend 80% of its capital reserves on Super Bowl ads last January was not long for this world. The same should have been obvious in response to a press release talking about spending a few tens of millions of dollars on a Web site to sell some yuppy bobbles. In a potentially related story, the auto industry announced the other day it was spending $75 million on a business-to-business Web site.

Just as it should have been a no-brainer to ignore the wacko projections of success that many of the business-to-consumer start-ups had, it should also be a no-brainer to recognize that business-to-consumer Web sites have a real future — maybe not billions of dollars per Web site — but a good, solid future.

Just take a look at the catalog business. My household gets catalogs from hundreds of companies every year. Every one of these companies could put up a cheap order-entry Web site and save money over having a human answer the phone. All they need to do is add a page in the catalog telling the reader the URL. That worked just fine for the specialty spices catalog we got the other day. They got a Web order the next day. (And I'd rather not say how much it was for.)

I see no reason to think the business-to-consumer companies are failing at a rate greater than catalog companies, they just blow a whole lot more money failing. Once some of the irrational exuberance has faded, the many quiet successes will become visible.

Disclaimer: I have found that the farther you are from Harvard, the more irrational the exuberance about the place is, but the above spice order was mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Latest version of IBM DB2 targets big e-commerce customers

Database supports data warehousing, larger memory.

BY DAVID LEGARD

IBM formally launched Version 7 of its flagship DB2 Universal database last week, targeting dot-com start-ups to Fortune 500 heavyweights.

The key difference in Version 7 is the product's level of integration of core database features, content management and business intelligence features, XML support and ability to handle spatial data types, according to Mike Babin, director for worldwide data management sales for IBM's software division.

"Technology must be able to support the new business models made possible by the Internet," he said at the launch. "Data must be available to all of a company's applications, systems must be scalable and companies need to be able to turn data into intelligence."

Apart from the rapid increase in the sheer amount of data that needs to be stored, DB2 Version 7 has been designed with several future market developments in mind, according to Babin. These include: wide availability of high bandwidth at low cost; pervasive computing; rich media content; and deep computing, or the ability to solve very complex problems.

"The next generation of e-business opportunities will be about developing new markets and new business opportunities," he said. "There will be billions of users and trillions of devices."

DB2 Version 7 includes data warehousing and online analytical processing capabilities as well as in-memory technology which can speed up Internet searches by a factor of 10, according to IBM.

Version 7 is immediately available for the AIX, Solaris, HP-UX and Linux variants of Unix, as well as Windows NT, Windows 2000 and OS/2.

The product costs $498 for the Personal edition; $1,349 for the Workgroup edition, $23,760 for the Enterprise edition and $30,510 for the Enterprise-Extended edition, offered on a per-processor pricing basis, IBM says.

Also included in the new version is a free downloadable migration kit that will make it easier to move to DB2 from database rivals, such as Oracle, Informix, Sybase and Microsoft's SQL Server.

Legard is with the IDG News Service.

Migration Tools,
continued from page 35

The SFN5 tools include Microsoft Directory Synchronization Services (MSDSS), which synchronizes Active Directory with NDS or NetWare 3.x binderies. The SFN5 tools also include the File Migration Utility, which lets users migrate NetWare files and their access control permissions to Win 2000.

But the focus is on the directory, where Microsoft is creating some confusion with MSDSS. The tool integrates NDS, Active Directory and its Microsoft MetaDirectory Services, which is designed to integrate a host of disparate directories.

"MSDSS should be considered a tactical tool for managing the coexistence of NetWare and Win 2000," says Neil MacDonald, an analyst with the market research firm Gartner Group in Stamford, Conn. "If all you want to do is connect NDS and Active Directory and longer term you plan to move entirely to Active Directory, MSDSS is the way to go. If you plan on having NetWare and Active Directory coexist longer term, then Microsoft Metadirectory Services or another metadirectory solution is a better long-term strategy."

Those metadirectory tools include Novell's DirXML, iPlanet's Meta-Directory Services and Critical Path's InJoin MetaDirectory.

With MSDSS, Microsoft has added a Web-based Password Reset Utility since shipping the SFN5 beta in February. The tool lets administrators change passwords in either NDS or Active Directory and synchronize in real time without waiting for scheduled synchronization cycles.

SFN5 is slated to ship at the end of this month although evaluation copies are available now. The price is $149.

Microsoft: www.microsoft.com/windows2000/guide/server/solutions/netware.asp

Worldweb.net,
continued from page 35

from XML to WML like Worldweb.net.

Expressroom I/O runs on any operating system, including Windows NT, Sun Solaris and Linux. Prices typically cost about $250,000 for an enterprise version, with an additional $50,000 annual maintenance fee. Companies can lease the software for $75,000 per year.

Expressroom I/O is used by more than 100 companies, including Kiplinger, *Women's Day Magazine*, Cycle World and Martindale Hubbel. ◪

www.nwfusion.com

PUBLISHING TO THE WEB

- Worldweb.net's view of XML.
- Details of the Wireless Markup Language.
- A look at how the Wireless Application Protocol and WML work together.

DocFinder 9034

find it online

Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

I've heard about a list of the top 10 Internet security threats. Where can I find it?

The System and Network Security Institute published the list of threats and recommendations for fixing them. A copy is at www.sans.org/topten.htm. The list represents an unprecedented example of cooperation among industry, government and academia. The threats:

1) BIND (Domain Name System) weaknesses that allow immediate root compromise.

2) Sample CGI programs installed with Web servers that allow perimeter defenses to be circumvented.

3) Remote Procedure Call weaknesses that allow immediate root compromise.

4) Remote Data Services flaws in the Microsoft Internet Information Server.

5) Sendmail buffer overflow weaknesses, pipe attacks and MIMEbo, which allow immediate root compromise.

6) Sadmind and Mountd buffer overflow flaws in Solaris Network File System (NFS).

7) Global file sharing via NFS and Windows NT ports 135 through 139 and port 445 in Windows 2000 and/or Unix NFS exports on port 2049.

8) User IDs, especially root/administrator accounts with no passwords or weak passwords.

9) Internet Message Access Protocol and point of presence buffer overflow vulnerabilities or incorrect configuration.

10) Default SNMP community strings set to 'public' and 'private.'

Blass is a network architect with Sprint Enterprise Network Services in Houston. He can be reached at drintranet@paranet.com.

Gigabit Ethernet is MAN's best friend

BY BOB KLESSIG

As e-commerce grows, companies are relying more on third-party hosted services to run online systems such as credit card processing. By tying together services from single-function application service providers, Internet entrepreneurs create more efficient companies than their traditional counterparts.

Such a distributed business model survives by one resource: bandwidth. If ASPs have problems communicating, the model crumbles. Internal networks at each ASP run quickly with LAN speeds climbing steadily since LANs became popular 15 years ago — most now run at 100M bit/sec. Likewise, the Internet backbone supports traffic at more than 100M bit/sec.

So why is it so hard — and expensive — to connect your fast LAN to the fast Internet backbone and ASPs?

The congestion lies between the LAN and the Internet. That bottleneck has been bridged through slow connections on the public network (dial-up modems, ISDN, DSL) or through fast but expensive dedicated lines (T-1, DS-3). To make matters worse, the two systems are completely different: There's no way to scale from, say, a 384K bit/sec line to a 45M bit/sec line without buying expensive equipment and waiting months for installation.

But now the metropolitan-area network (MAN) based on Gigabit Ethernet technology can help reach service providers.

Improvements in two technologies make this MAN possible. First, data through an Ethernet connection can now be transmitted over a much greater distance — 50 miles or more — and travel at rates up to 1G bit/sec, with speeds of 10G bit/sec coming soon.

The second technology that makes this MAN work is fiber optics. Infrastructure companies have invested billions of dollars to install fiber-optic cables beneath sidewalks and city streets around the world, and these cables have substantial available capacity. MAN service providers lease this dark fiber; add switches, control monitoring and security services; and sell the improved fiber bandwidth capabilities at relatively low prices.

Several networking complications disappear because these MANs are based on Ethernet instead of voice-oriented SONET or ATM technologies.

First, no significant translation is needed to pass data between a LAN and a MAN, so administrators don't need to maintain expensive, complicated equipment. No new skills are needed to connect to a MAN: Just plug a standard RJ-45 plug into the box — the "demarcation device" — connecting a LAN to a MAN.

The most flexible and cost-effective MANs support multiple customers on a common infrastructure of fiber-optic cable and switches. Thus maintaining the separation and integrity of traffic from customers is mandatory. An effective way to do this is to use a connection-oriented service model with access and delivery control to ensure that the connections are leakproof, meaning traffic from one connection cannot get intermixed with traffic on another connection. The customer can then layer additional security functions on top of the MAN service as needed.

When a company signs on to a MAN, the most noticeable benefits are prices, which are about 25% to 75% lower than comparable bandwidth on SONET/ATM; faster Internet access; simpler "closed" intracity networks; and an easier-to-adjust bandwidth profile, so participants pay only for what they use.

The biggest disadvantage of a MAN is it's generally available only in areas where there's a high population density, which includes only about a dozen cities. But several companies plan to introduce Ethernet-over-fiber MANs around the world, and it's estimated at least the top 50 metro areas will be in service by mid-2001.

MANs are not a new phenomenon. Small-scale private MANs have existed for years. But because of recent developments in fiber optics and Ethernet technology, they've become cheaper and more flexible than ever — and will probably be available in your area soon.

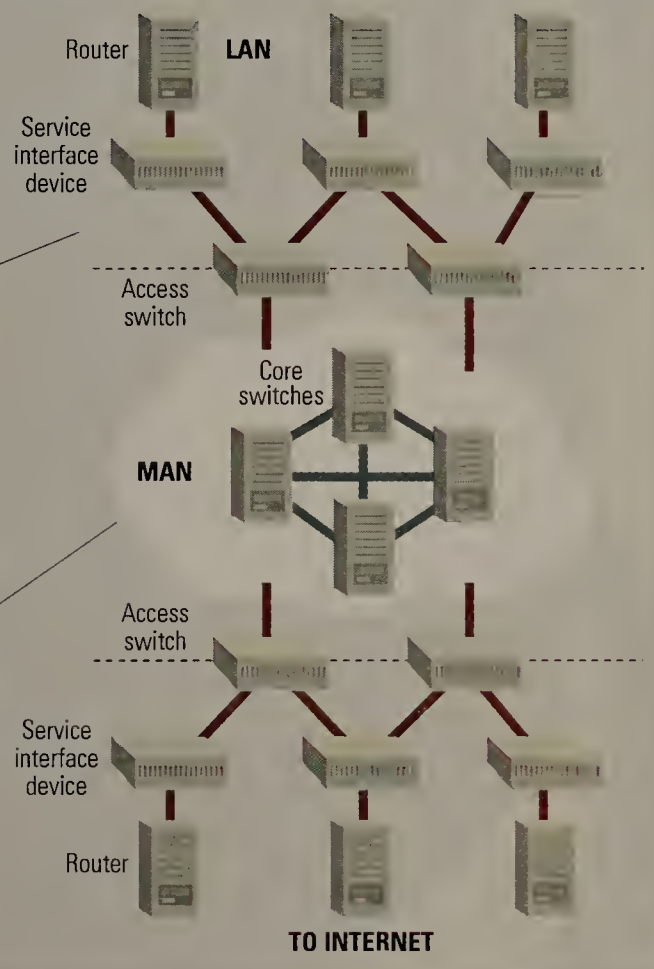
Klessig is vice president of business development at Telseon. He can be reached at bob@telseon.com.

UPCLOSE Why fiber is 'the MAN'

Metropolitan-area networks (MAN) based on Gigabit Ethernet and fiber optics help eradicate the bandwidth bottleneck between corporate networks and the Internet. MANs also produce bandwidth that is significantly cheaper and can adjust more easily to a customer's changing needs, according to proponents.

1 **Unlike with SONET or ATM, no significant translation is needed to pass data between the LAN and the MAN, precluding the need for costly, complex equipment. Connecting to the MAN means plugging a standard RJ-45 plug into the service interface device.**

2 **A common infrastructure of fiber-optic cable and switches provide flexible, cost-effective services and the framework for adding additional security functions according to customer needs. Such services let customers order only the bandwidth they need.**



Gearhead — inside the network machine . Mark Gibbs

THE ELEPHANT REMEMBERS TO REMEMBER AUDIO

Gearhead is like an elephant — not in corpulence (at least, we hope not) but in memory. Some time ago (www.nwfusion, DocFinder: 9035) you were promised more on audio, and this week Gearhead delivers. We'll deliver the heady world of Winamp from Nullsoft.

If you haven't checked out this program, do so right now — it is truly excellent (www.winamp.com). Winamp is free and plays MP3, CD, MIDI, VOC, WAV, MOD, WMA, AudioSoft and MJuice audio playback formats.

The last two formats are proprietary: AudioSoft is from AudioSoft (www.audiosoft.com), a company that aims to provide copyright control for digital music as well as usage reporting. It is not surprising that few people outside of the major labels and AudioSoft like the format very much. The other format, MJuice, is an encrypted version of MP3 that seems to have more market acceptance than AudioSoft.

Anyway, installation of Winamp is so simple that we will not spend any time discussing the process.

Winamp's interface is terrific. It is a beautiful design and features something that should be in all Windows applications — the ability to seamlessly align Winamp's four components next to each other. The core component is the main window, which controls play, pause, stop, forward song, previous song and select new song. It also has a built-in spectrum analyzer and oscilloscope, a position slider (to change the point in the song where you are playing), and controls for balance, volume, shuffle and repeat (whew!).

The other windows include a combination preamplifier and graphic equalizer, a play list manager and a "Minibrowser" (which is used to access Winamp and artist-related resources).

Winamp is skinnable so you can change the look of the software as you wish. The Winamp site purports to offer 12,500 skins so you should be able to find something you like. Or you can create your own — the process is explained on the Winamp Web site (www.winamp.com/nsdn/winamp2x/dev/skins/).

Another cool thing about Winamp is it is plug-in-based. This means not only can any existing or future audio format be supported but also the input to and output from Winamp can be intercepted. This allows for lots of strange experimental tools.

But the best parts of the plug-in system are the visualization plug-ins. These allow the spectrum and oscilloscope outputs to drive graphical displays that are fantastic! You get scores of visualization schemes with the included Nullsoft Winamp Advanced Visualization Studio. Put aside lots of time to play with this feature.

Winamp also supports streaming media called Shoutcast and boasts a large number of online radio stations (including the first Russian streaming dance club station). If you use Winamp to play CDs, it can automatically check online CD Database for official CD information.

Gearhead loves this software! Five gear teeth out of five!

Wild enthusiasm to gh@gibbs.com.

"Give me one good reason to buy Anritsu's MultiFlow™ 5000 Layer 2/3/4 Switch."

We can do better than that.

1. LAN, MAN, WAN connectivity in one.
2. Layer 2/3/4 switching at wire speed.
3. 100BASE-TX/FX.
4. Gigabit Ethernet—1000BASE-T/SX/LX.
5. IP, IPX and AppleTalk routing.
6. ATM OC-3 and V.35.
7. OC-48, available now.
8. Up to 32 Gigabit Ethernet ports.
9. Full hardware redundancy.
10. Load balancing.
11. Link aggregation.
12. QoS traffic prioritization.
13. RIP and OSPF.
14. Multicast routing.
15. IPsec VPNs.
16. Web-based management.
17. 4 models, one for any size network.
18. It's built by Anritsu.
19. It's supported by Anritsu.
20. It's priced lower than you know who.

Now, you have an alternative. The MultiFlow™ 5000 from Anritsu. It raises the stakes for switch performance, connectivity and affordability. And because Anritsu is a billion-dollar-strong supplier to 80% of the telecommunications industry, you know it's reliable. So visit www.us.anritsu.com. Or call 1-800-ANRITSU today. It's the only reasonable thing to do.

Linking the World

MultiFlow™ 5000 Multilayer Switch

MultiFlow 5128
12-slot chassis
128 Fast Ethernet or 32 Gigabit ports

MultiFlow 5064
8-slot chassis.
64 Fast Ethernet or 16 Gigabit ports

MultiFlow 5048
Standalone with 32 Fast Ethernet + 2 Gigabit ports 2 expansion slots

MultiFlow 5024
Standalone with 24 Fast Ethernet + 2 Gigabit ports

Anritsu
Multilayer Switching

©2000 Anritsu Company MultiFlow is a trademark of Anritsu Company

Management Strategies

Career Development, Project Management, ROI, Business Justification

To train or not to train

Keeping employees up to date on technologies could keep them at your company for the long-term.

BY DENISE DUBIE

When John Lambert wanted a position that challenged and improved on his broad knowledge of technology, finding an employer that encouraged and financially supported professional certification toppcd his list of priorities.

"It's absolutely essential," Lambert says. "And I would not want to be any place where it is not essential. I do not want a kick-back job." Lambert, who's worked in the network industry for about 10 years, most recently was chief technical officer at a dot-com, so staying on the bleeding edge of technology is a must-have element in his work environment.

For more than a month, Lambert has been working as a network engineer at In-Q-Tel in Arlington, Va., a nonprofit corporation chartered by the CIA to develop technology. Given all the certifications listed on his resume, the 42-year-old Lambert says before his current employer interviewed him, he assumed he was at least 60 years old. Lambert studied on his own to become certified as a Cisco Certified Network Associate, Microsoft Certified Database Administrator, Microsoft Certified Solution Developer and Microsoft Certified Systems Engineer + Internet (MCSE+I). He is working to become a Cisco Certified Network Professional and an Oracle Certified Database Administrator.

Lambert's motivation to further his IT education comes from within. He thrives on new technologies and has never received a raise for obtaining certification. Howevcr, having diversc training and several certifications boosts his credibility when debating technology decisions with management.

In some cases, former employers that reimbursed or paid outright for certification "almost did so grudgingly," Lambert says.

"You may not be able to keep them forever, but those people aren't the type that would stay forever anyway," Lambert says. "If an employer supports training, employees will be inclined to stay longer and they will be more productive while they are there."

Lambert's opinion is fairly common among network professionals, according to the Nctwork World Salary Survey. The survey found that many high-tech workers value training, professional development, challenging work and access to new technologies over factors such as raises, salary and comp time. Although the survey revealed no direct correlation between certification and salary, in some cases those with certification earn more. And if training is part of the overall benefits package, a company will have a leg up on recruitment and retention.

In fact, it's State Street's benefit package, which includes an annual training budget for employees, that keeps Sherry Callahan happy with her position there. In her roughly three years as senior network administrator at the financial services firm's Kansas City, Mo., location, Callahan earned her A+, Certified Novell Engineer, Microsoft Certified Professional (MCP) and MCSE+I designations. And although State Street doesn't immediately compensate an employee for getting certified in terms of salary, promotion or bonuses, Callahan says the company proves its commitment to the staff.

"At the point of certification, that person has already reaped the benefit of having State Street pay for the classes and exams," Callahan says. "In the case of an MCSE certification, the company has already invested $6,000 in that individual."

While State Street appreciates a knowledgeable staff, Callahan says employees must use what they've learned in order to be rewarded. "A certified person who has applied their new knowledge to their job and projects within the department would receive a larger raise than a certified person who did nothing other than maintain the status quo," Callahan says. "I would never promote someone simply because they were certified."

Michael Schaffer agrees. As network manager for Ametek's U.S. Gauge Division in Sellcrsville, Pa., he's scen a lot of paper certifications without all the necessary experience to back them. Schaffer has his CNA and MCP certifications and is currently working on his MCSE, but he wasn't promoted, nor did his salary increase because of the credentials. He set his training goals, and his management supported them. That's important to Schaffer, who has been with the company for 10 years.

"I belicve it goes back to how wcll the employer treats the employee in all aspects, including pay, vacation and benefits in general," he says. Schaffer notes that training helps employees feel comfortable with technology and employers gain a staff that's better equipped to handle technical issues.

John Lambert of In-Q-Tel has four professional certifications under his belt and is working to obtain two more.

DOUGLAS WOODS

According to In-Q-Tel's Lambert, employees should be appreciative when an organization invests in its staff. "A true IT professional will recognize the company's commitment to them and return it by staying and applying that knowledge," he says.

Moreover, providing the necessary certification and training to feed the network professional's appetite for knowledge can only benefit a company, Lambert says.

"People will get the training on their own anyway and be less happy with their employer," he says. "You want to gct the most out of somebody's abilities when they are with you. Support the certification process, and your staff will stay with you longer." ◪

www.nwfusion.com

GETTING AHEAD

By the numbers: Salaries with certification vs. without.

Salary calculator: How much you should be making.

Certifiable: All about training programs.

For more on the factors affecting your salary, see the results of the Network World Salary Survey, page 61, just one part of our second-annual You Issue starting on page 45.

DocFinder 9023 find it online

Opinions

Editorial

Trying hard to put access in every pot

After applauding Ford and Delta in February for picking up part of the tab for connecting employees' homes to the 'Net, I decided to try to pull together a similar program for Network World. Easier said than done.

The company that Ford and Delta work through is PeoplePC, which buys bandwidth and PCs in bulk and passes on the savings to customers in the form of attractively priced machine/service bundles. While the average consumer pays $25 per month for the bundle, companies like Ford underwrite part of the expense and employees only pay $5 per month to get online.

I contacted the company about a corporate deal and, surprisingly, it said it was still finalizing the program and would get back to me soon (Ford and Delta must have been beta customers).

Two months passed and I messaged them asking what was up, and they wrote back asking if I would fill out an online questionnaire.

Some of the questions were obvious, like how many employees we have (150), what kind of systems we need (the entry level 400-MHz Celeron Toshiba would do fine), and what type of software and 'Net access would be required (Microsoft Works, 56K dial-up).

But the company also wanted up to 200 words explaining my "primary objective for an employee connectivity program." That struck me as kind of odd. They also wanted me to rank a list of reasons for initiating a connectivity program, things like: enhance employees' technical knowledge and skills; reduce communication and administrative costs; and, attract and retain employees.

Either *Network World* is too small to bother with or they didn't like the way I answered the survey, because it has been three weeks and I haven't heard from them. The long and short of it is PeoplePC seems to be struggling a bit getting its corporate program off the ground.

In the meantime, however, I signed up for one of their packages for my home and can report that the overall experience is very good.

The online sign-up form is straightforward, the system arrived promptly and setting it up and logging on to the 'Net was a snap.

If the company could get its act together I would recommend the service as a way of pushing your work force into the Internet age.

— John Dix
Editor in chief
jdix@nww.com

Message Queue

Thoughts on WorldCom

I can't believe Joel Snyder could have written "MCI WorldCom should finish what's already on its plate" (www.nwfusion.com, DocFinder 8925) without talking to me. How else could he have so accurately recounted my experiences with WorldCom over the past few years?

Snyder has destroyed my last, best chance of getting competent work out of WorldCom. I was going to threaten them with "going to the press," but now I'll have to continue living with installs measured by the passing seasons and billing errors dating back to when Chicago was a basketball powerhouse.

Mark Kent
Director, network operations
The Internet MainStreet
San Jose

I disagree with Joel Snyder's comments about MCI WorldCom's lack of customer service. I am currently in the process of switching more than 60 locations from AT&T to WorldCom, and my experience with WorldCom customer experience has been nothing less than stellar. Our installations have been flawless. When a circuit goes down, a proactive ticket is opened and we are notified within minutes by a personable, knowledgeable customer service rep. We get hourly updates on the status of the problem and a call to verify that service has been restored.

My experience with carriers has been that they are only as good as your account team. Ours is fantastic — we consider it an extension of our WAN team. Maybe Snyder should ask for a new account team.

David Wesch
Director of communications
American Color
Brentwood, Tenn.

My company had T-1.5 Internet services with MCI WorldCom. We switched to a different carrier around the time our contract ran out. It took 10 months and at least four sales reps to get a new contract in place and the billing cleared up — apparently WorldCom did not send all our customer records with the transfer of services.

We started local service with MCI WorldCom around the time of their merger. The cutover and service was on time, and everything worked fine. Customer service has been a different story. After more than a year of service, they still couldn't get our billing right.

Four months ago, I transferred our local service back to the local Bell. The service is better and costs less, and the billing is correct. I'm still trying to get our billing with WorldCom straightened out.

Michael Schwab
Cincinnati

Monopoly points

Regarding Mark Gibbs' "Backspin" column "The ghosts of departed quantities" (www.nwfusion.com, DocFinder 8926): For the 27,643rd time, it is not illegal to have a monopoly.

When did Pitney Bows leverage its postage meter monopoly to promote using just its brand of envelope to put the postage on? When did Westlaw leverage its legal reporting monopoly to promote using just its brand of textbooks in law school?

It's leveraging a monopoly to dominate fields where you don't already have a monopoly that's illegal, and that's exactly what Microsoft is doing. No company should be exempt from prosecution because its illegal activity has been so wildly successful.

Andrew Grygus
La Crescenta, Calif.

Defrost that drive

At the end of his "Gearhead" column "Data recovery and coffee coasters" (www.nwfusion.com, DocFinder 8927), Mark Gibbs asks for recovery stories. Here's a data recovery method that has worked for me. When a drive has failed but was previously working fine, remove the drive from the PC, seal it in a Ziploc bag and put it in the freezer for a few hours. After you remove it from the freezer, connect it to a PC and either clone it or back it up, as you will be able to read the drive for about a half-hour.

John Secondino
New York

E-mail letters to jdix@nww.com or mail them to John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

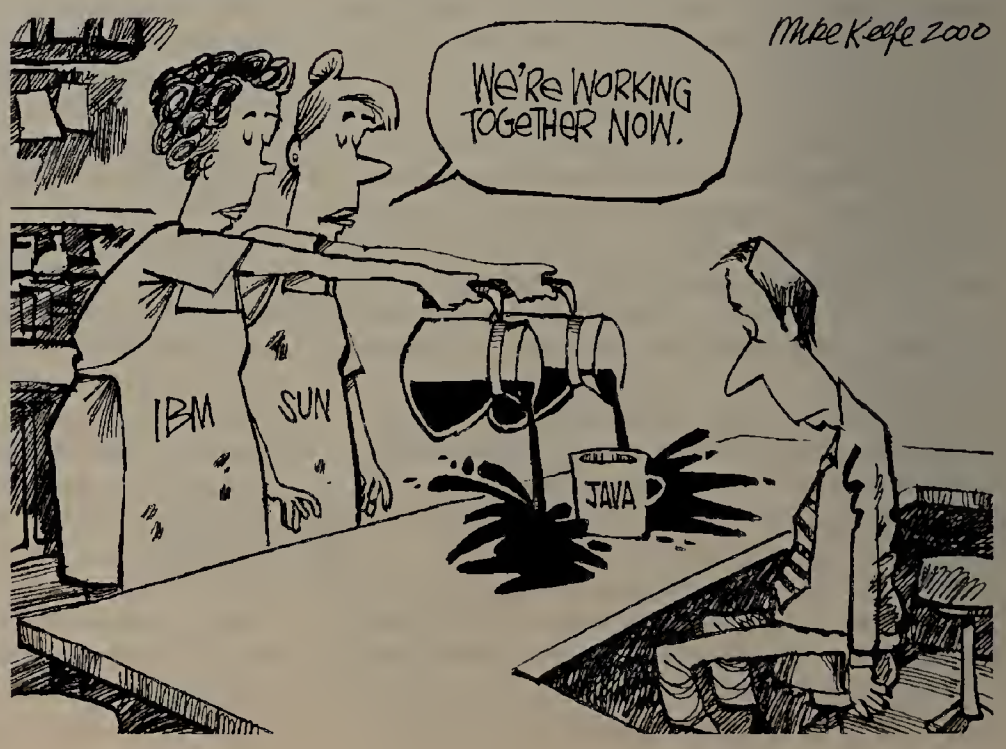
www.nwfusion.com

MORE ONLINE

Find out what readers are saying about these and other topics.

DocFinder 9030

find it online



Intranet Adviser . Daniel Blum

Don't get lost in Active Directory forests

Windows 2000 rollout is one of the most important deployment initiatives most organizations will undertake in the next two years. An important design decision is whether to go with single or multiple Active Directory "forests" for your production intranet.

Active Directory merges Microsoft NT domains with Domain Name System domains. Then, within the Active Directory domains, customers can store Lightweight Directory Access Protocol information about organizational units, users, groups, computers and other objects. Each domain reflects an IT organization with its own security policies and administration organizations.

Active Directory takes the domain model a step further, enabling a "forest" construct through which many domains in a company can be grouped together. When multiple domains are grouped into a forest, they share a searchable Global Catalog, transitive trusts and universal groups for access-control purposes.

This means that when a user logs on to any domain controller in any domain of the forest, his Kerberos access token gets loaded with the Security Identifiers (SID) of all the groups to which he belongs. Some of these groups are universal groups in the global catalog, which can contain users from multiple domains. When the user connects to any domain in the forest, transitive trusts kick in to authenticate the user automatically. Similarly, the group SIDs in the user's access token act as tickets to ride any resource in the domain authorized for that group. The single point of administration and single sign-on features sound like a dream come true.

But forests also share a configuration container, which includes the schema, or logical data definitions that all domains must use. This means organizations with a single production intranet forest must also have a single "schema control committee." Because directory-enabled applications such as Microsoft Exchange change the schema, IT organizations in different domains must coordinate deployment and versioning of those applications, necessitating an "application certification board." This represents more centralization and coordination than many organizations are used to.

So you have two options. You can deploy one forest with relatively few applications changing the schema (and, therefore, with reduced functionality) and tighter coordination among business IT functions. This approach offers cross-forest single point of administration, single sign-on and reduced total cost of ownership (TCO). Or, you can deploy multiple forests with a high degree of business unit autonomy and many applications (that is, high functionality). At the price of increased complexity and TCO using metadirectory services to synchronize information across forests, you can restore some of the benefits of the single forest, but not all.

Blum is senior vice president and principal consultant with The Burton Group, an IT advisory service. He can be reached at dblum@tbg.com.

Reality Check . Thomas Nolle

Will licensing issues kill Internet video?

There's probably no issue about the Internet that provokes as emotional a debate as the matter of "free" content or distribution of material. As recent cases involving MP3 audio have shown, the Internet can become a battleground between those who believe in free exchange of entertainment media and those whose living depends on selling that material. Now we may be headed for a similar face-off in the video space.

Most video material is produced for broadcast or cable television. While the laws that govern this material vary from country to country, it's generally true that the owners/producers and the broadcasters have rights to benefit from their investment. In theory, they could set virtually any fee structure for rebroadcast of their material, and that would include Internet distribution.

In practice, governments have routinely passed "compulsory license" laws, which require broadcaster/owners to license material to be broadcast on another media for a government-regulated price. We already see this with the cable television industry, which rebroadcasts network and local programming. Some think we should see the same principles apply to the Internet; others disagree. Congress recently opened hearings on whether the compulsory license principle should apply to the Internet, so the political process may step in and decide. The issues are complex, though, and finding consensus may be tough.

One option is for Congress to do nothing. This is a view favored by broadcasters and studios, which want to let the free market determine the royalties paid to rebroadcast video on the Internet, and some Internet advocates, who don't want any government regulation of the Internet. We had a taste of this argument in the disputes over redistribution of music on the Internet.

A Canadian dot-com company, iCraveTV, has attempted to provide free video on the Web. The company was sued and subsequently agreed to stop broadcasting the material until "Canadian law is clarified." If the Web were declared to be a kind of copyrightless zone, the impact on overall distribution of entertainment and other media would suffer. Furthermore, the courts have generally upheld the right of copyright owners to prevent free distribution and use of their material. It's unlikely that U.S. public policy would reverse this trend, and thus unlikely that truly free Web video will be possible.

Some of the larger Internet players, including AOL, seem to favor compulsory licensing, although support for this measure would surely depend on how royalties were set. Their concern is video material might not be offered to Web providers at all, helping to preserve the role of cable, broadcast and satellite players. By getting a compulsory license law for the Internet, video material would be guaranteed to be available.

But even a Congressional solution might not be a complete one. The Internet is multinational, and copyright law and broadcast rights vary considerably from place to place. What happens if material offered in a country that does not have licensing fees for rebroadcast is captured there, then introduced onto the Web? How are rights enforced, particularly when even software copyrights aren't always honored in the world market?

The issue may be especially critical now that the regional Bell operating companies are beginning to deploy DSL in earnest. SBC Communications expects to be able to service 18 million DSL customers by year-end. With true asymmetric DSL, the new network would support video content delivery if business and regulatory issues were resolved, and if SBC had the incentive to make it work technically.

I've always thought voice over IP was dumb. I still do. But video over IP might be something else, and the Internet has the potential to offer the most flexible video delivery mechanism we've ever known. It also has the potential to lay the biggest video egg in history. Congress can hold the hearings, but it may be the public attitude on this issue that will decide the future of compulsory licensing. That, in turn, may decide whether you can look at the Web or watch it.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

Better

and easier to make your network

safe

secure, and reliable

than

to have to convince everyone how

sorry

you are when something goes terribly wrong.

Nokia – the brand name you associate with the world's most popular mobile phones – is also an IP networking company. Surprised?

More than 250 of the world's most successful companies trust Nokia to secure their networks. They've experienced first-hand the outstanding performance of our truly reliable, secure network application platforms.

As the market share leader in the VPN hardware market,* with over 17,000 systems installed, and networking partners like Check Point Software Technologies, Internet Security Systems, OpenService and Websense, Nokia is ready to help you meet your toughest IP network security challenges.

For people who are managing increasingly complex network architectures, Nokia provides best-of-breed networking products that reside between infrastructure and content, making e-business environments secure, reliable and scalable.

Engineered for rapid deployment and reduced total cost of ownership, Nokia platforms are backed by our world-class "first-call, final-resolution" technical support team.

Nokia – building networking products to exceed your expectations.

Platform Family

IP330

IP440

IP650

IP Network Application Platforms

NOKIA

CONNECTING PEOPLE

For the latest white papers and customer profiles, click on IP Networking at

www.nokia.com

1 877 997-9199

Copyright Nokia Internet Communications Inc. 2000. All rights reserved. Nokia and Nokia Connecting People are registered trademarks of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

* Infonetics Research, VPN Hardware Market Research (Nokia/Check Point Software Technologies)

A TOAST TO YOU

Perhaps you don't need to be told this, but I'll say it anyway. You are a thoughtful, intelligent, fun, quirky, passionate group of people.

We've been reminded of this as we gathered information on you for this Signature Series edition, the second-annual You Issue. We spent hours talking with many readers one-on-one and gathered the opinions of thousands more through three surveys — our annual Salary and You surveys, and our new Top Concerns report.

As you'll find in these pages, the result of our research is a celebration of you, the *Network World* reader. We revel in your ability to complement your professional choices with personal passions (see "You work where?," page 77), admire the commanding positions you hold as corporate America embraces the technology-centered Internet Age (see "Your e-volution," page 55) and cheer for you as your salaries surge (see "Getting your due?," page 61).

Most of all, we honor you for your dedication to the IT profession. Here's to long, illustrious careers and lots of fun in your off hours!

— BETH SCHULTZ
Executive Editor,
Signature Series
bschultz@nww.com

THE SIGNATURE SERIES

The You Issue is one of six bimonthly supplements providing insights, opinions and information on the biggest trends shaping the networked world. Look for the inside stories on the latest hot network technologies and topics in the next installment of the Signature Series, the Buzz Issue, coming Sept. 11.

THE Signature SERIES

you

47 YOUR TOP CONCERNS
Managing employees worries you most, finds an exclusive *Network World* survey.

50 COFFEE WITH YOUR PEERS
Five IT executives chat about the technology, management and business issues served up at work.

55 YOUR E-VOLUTION
The Internet economy has conjured up a world of career opportunities. Do you know how to grasp them?

61 GETTING YOUR DUE?
The *Network World* SALARY SURVEY shows that total compensation is starting to reflect the increased importance of networking.

73 SHOULD YOU HEED A VENDOR'S CALL?
Tales of network executives who have leapt to the vendor ranks.

77 YOU WORK WHERE?
Our annual foray into the unusual places you do your jobs.

85 YOUR PERSONAL CHALLENGES
In IT, a disability is no liability.

91 YOUR LIFE BEFORE NETWORKING
From truck drivers to mountain climbers, people from all walks of life are bringing their nontraditional experiences to network jobs.

95 SIGNATURE SIGN-OFF: PUT YOUR CAREER CHOICE TO THE TEST
Our personality test will help you determine if you're in the right line of work.

Page 50

Page 55

Page 61

Page 77

Page 91

Page 95

You online

Visit our special Network World Fusion minisite **(www.nwfusion.com/you2000)** for tools, talk, data and research, all for you. You'll find:

- **OUR 2000 SALARY CALCULATOR, which you can use to compare your salary with those of your peers based on position, education, location and other factors.**
- **HORDES OF RESEARCH that address the chief worries you told us about in our first Top Concerns survey, plus results from that survey diced by job description and other factors.**
- **MORE OPINIONS AND ADVICE from our roundtable participants, presented in Web multimedia fashion.**
- **An interactive CAREER QUIZ.**

Cover photograph by Martin Paul

Cluster technology is a buzz phrase these days. But the real question is: what can cluster technology do for you? Or more appropriately, what can Linux NetworX™ cluster technology do for you? For starters, we give you computing power that is flexible – pay for what you need today, add later.

You need to plan for what you can become, not what you are.

Whether you're large or small, a Linux NetworX system will meet your demands now and in the future. But there are other benefits. Like our ClusterWorX™ control system. Implemented at both the hardware and software levels, with full remote capabilities, ClusterWorX is the only comprehensive, architecture-independent cluster management system. To find out how a Linux NetworX system can help you prepare for your future, visit *linuxnetworx.com* or call *1-877-502-LNXI.*

THE BENEFITS OF OUR CLUSTER SOLUTIONS:

High availability with no single point of failure

A fraction the cost of other alternatives

Easily managed single image systems

Grows with you

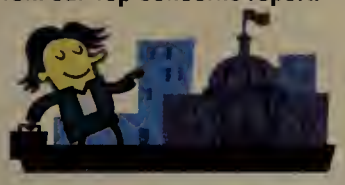
Linux NetworX™

Powerful Cluster Technology™

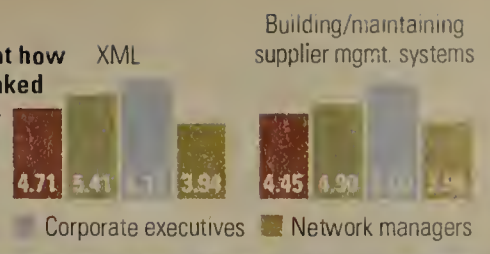
Your Job

FACTOIDS ABOUT THE READERS gleaned from our Top Concerns report:

- On average, respondents manage 19 employees.
- Respondents work among 12 industries, with half from government, education and finance.
- One third work at companies with more than 20,000 employees.

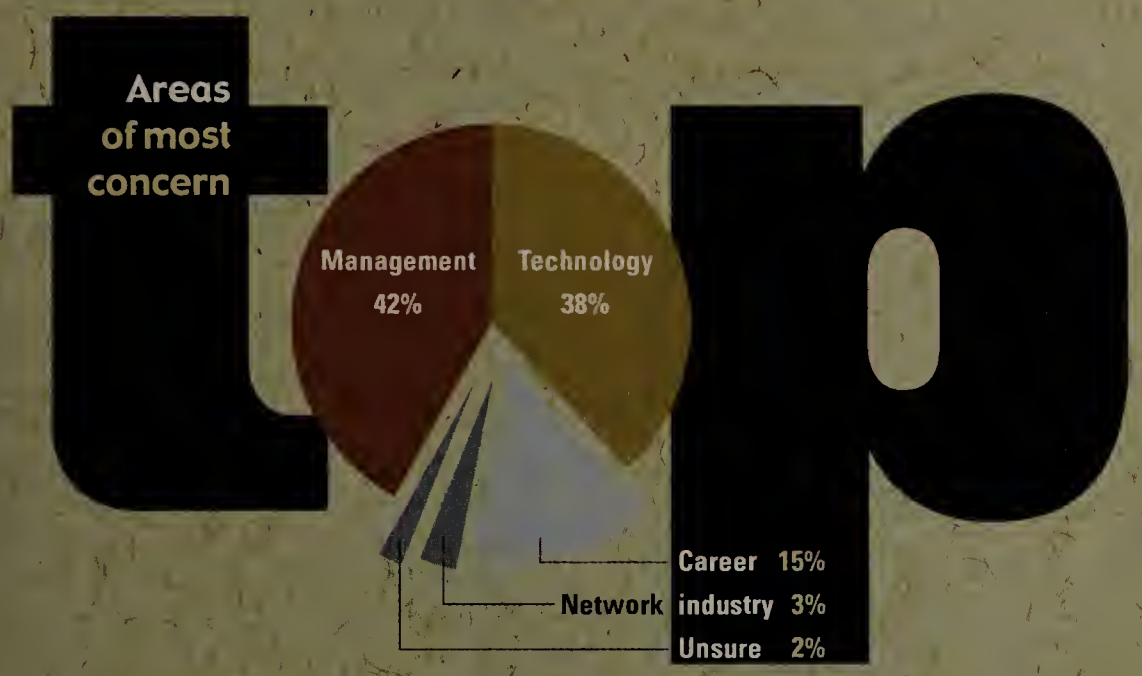


E-COMM DISPARITY A look at how various personnel groups ranked their concern about e-comm-related technology issues on a low-high scale of 1 to 10.



Your top concerns

MANAGING EMPLOYEES WORRIES YOU MOST, FINDS AN EXCLUSIVE *NETWORK WORLD* SURVEY.



By Julie Bort

It's 11:30 p.m. You close your eyes . . . and find yourself in a swirl of green fog, sitting at your desk, typing madly. Lightning descends from the sky with a heart-thumping crack, and in that one brilliant flash your stack of project requests magically doubles. Moments later, red flashing alarms beep at you from your monitor's screen. As you turn to dispatch one of your network administrators to fight this fire, she evaporates . . . you bolt awake. It's 2:30 a.m. Employee management worries are keeping you up at night.

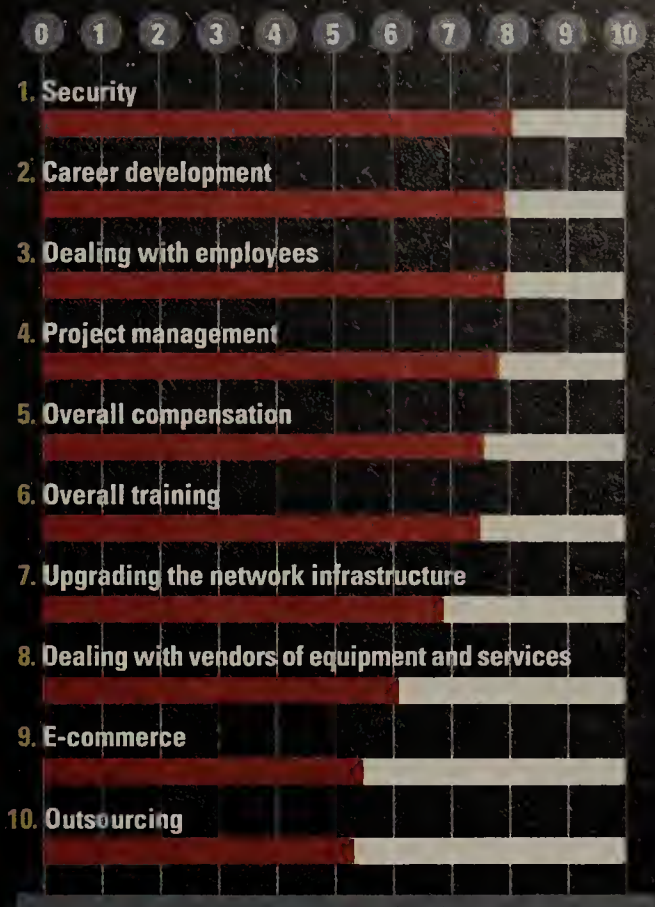
So indicates the results of a survey we undertook to find out what parts of your job concern you most. In the three-part survey, conducted for us by Research Concepts in Berlin, Mass., 100 network executives at companies with 1,000 to more than 20,000 employees ranked overall areas of concern. They then rated their general concerns on a scale from 1 to 10. Lastly, they drilled down for ratings on 35 specific concerns.

When ranking overall concerns, management came up tops against technology, career and industry changes. Forty-two percent of respondents ranked management as the area that causes them the most concern. Technology followed closely, with 38% of respondents giving it the "most concerned" rank. Career was far behind, with only 15% rating it as the area of utmost concern, and the network industry was rated last, with only 3% most concerned. Fifty-eight percent ranked the network industry as the area of least concern. As one respondent explained: "My main concern is being able to accomplish high volumes of work with the amount of staff I'm provided. I either need more staff or less work required of me."

Once employees are found, network executives scratch their heads over how to keep and train them. "Employees? They're the ones who get the job done! If you have good employees, how do you keep them? How do you find and attract new employees, with new skills, who work well with us?" one respondent declared.

Top 10 general job concerns

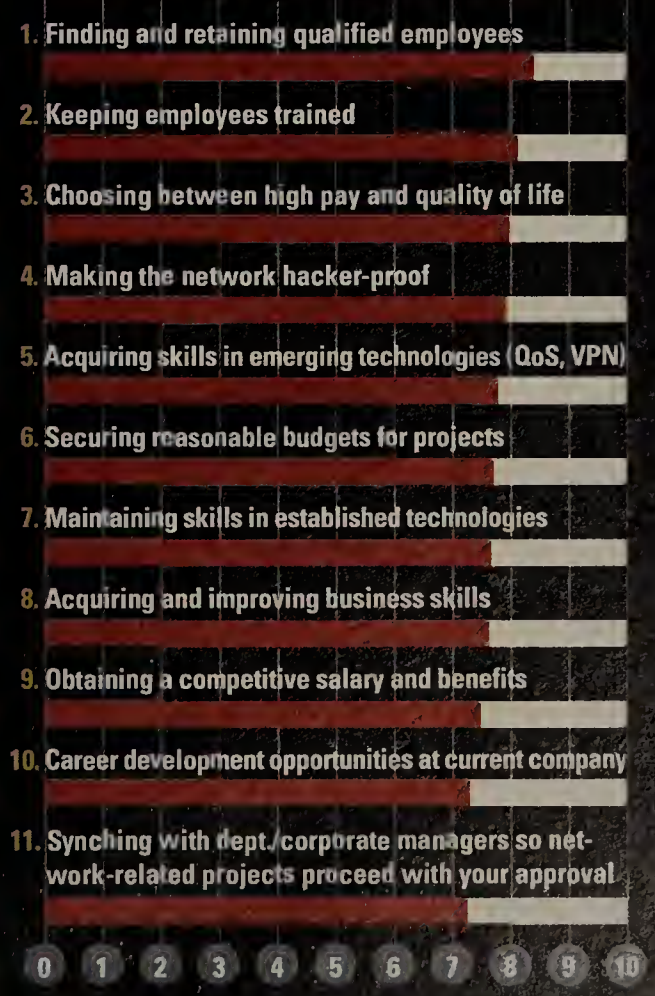
SECURITY TOPS THE LIST of general job concerns of the 100 network executives we surveyed. They rated 10 general job functions, using a scale of 1 to 10, with 10 representing "extremely concerned."



Digging into the concerns

Of most concern

WE ASKED 100 NETWORK EXECUTIVES to rate how concerned they were with 35 specific job duties, using a scale of 1 to 10, with 10 representing "extremely concerned."

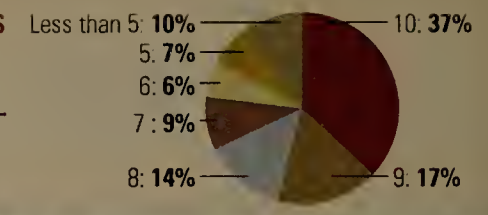


Your Job

VOICES OF CONCERN Asked, "When considering the next 12 to 18 months, what overall area of your job concerns you the most?" respondents said:

- "Assuring the outside world doesn't get access to our systems."
- "Having good personnel, and by that I mean having good, qualified technical people who will stay with the company longer than three to six months."
- "Return on investment. It's hard to measure the value of training. If it can't be measured, then it can't be funded."

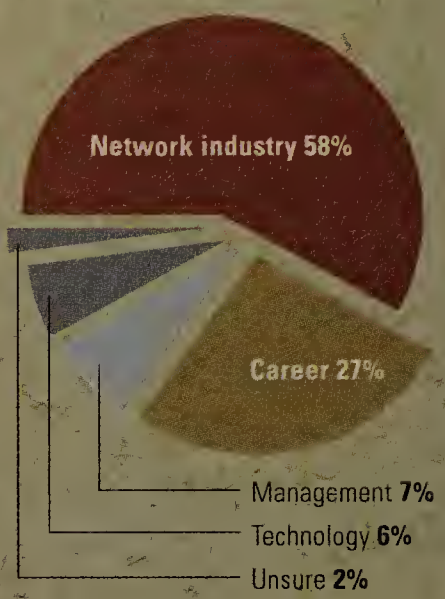
SECURITY WORRIES Nearly two-thirds of respondents gave security a top-concern rating of 9 or 10.



The issue of finding and retaining qualified employees rated an 8.36 — your highest concern on the list. Employee training rated your second highest concern, with an 8.08.

For the latter, expense is the problem because training is costly, respondents told us. Worse still, once trained, you are often forced to increase pay for the employee or risk losing that person to a better offer. As one respondent put it, "We lost a [network] person to retirement and hired a younger person to take his place. When he gets his training, we will not be able to pay him what he will be worth in the market today."

Area of least concern



Security scares you

On the heels of human resources concerns come overall technology worries, security in particular. Security, as a general issue, hit a mean of 8.01. The closer the respondent was to direct network responsibilities, the higher the concern over security. Senior corporate-level managers to whom technical units report rated security a 7 while network directors/managers gave it an 8.33. Clearly, computer security has become the domain of the network executive.

Of all the ways to have a breach, hackers are the threat that knits your eyebrows most tightly. Keeping the network safe from hackers rated a 7.94 among all respondents, again with those claiming titles of network director/manager more concerned about this than any other category of respondents. For them, hackers rated an 8.34. Many told us the source of the concern is someone gaining unauthorized access to the company's financial information and confidential data about customers.

Others added that the perception of being insecure is just as deadly as a successful attack. As one respondent said, "If someone broke into our Web site or our network, it wouldn't matter what the network had on it, we would be shut down because we wouldn't know how badly we were compromised. No degree of network infrastructure would mean anything if we were violated."

Personally speaking

Although few people named career as their top overall worry, some specific personal concerns have you extremely anxious. The choice between high pay and quality of life weighs heaviest on your minds, rating a 7.96. Or as one person described: "Money is the only reason I do this. It's why I miss my kids' birthdays. It's why I put up with this job."

Many long hours are spent frantically trying to keep up with the whitewater-fast pace of technology. Acquiring skills in new and emerging technologies, such as quality of service and VPNs, rated a 7.74; maintaining skills in established technologies such as routing or switching, rated a 7.62; and acquiring and improving upon business skills rated a 7.59. "If I don't improve my training," one respondent said, "I lose my ability to advance. And if I don't stay ahead of my employees, I lose my effectiveness."

End of the line

Interestingly, those with network-specific titles remain unworried about finding outsourcers, rating that task at a mere 3.61. Yet, those who hold broader IT responsibilities — senior IT executives including chief information officers, vice presidents and managing directors of MIS — rated this task a 5.85.

"I'm still responsible for these subcontractors doing their job," explained one respondent.

When factoring in all job titles, the areas that concern you least are implementing and managing hosted services, and building and maintaining supplier management systems, such as e-marketplaces. The former rated a 4.18 generally, and a 2.75 among network managers/directors specifically — the lowest number in the survey. The latter task rated a 4.45 generally and a 3.94 among network managers. However, it was of significantly more concern to corporate executives, who ranked supplier management systems a 6.0.

Those tasks are coming, yet today they don't take precedence over managing your current needs, which one participant succinctly described as: "Too much work, not enough people."

DocFinder: 9021

More online www.nwfusion.com/you2000

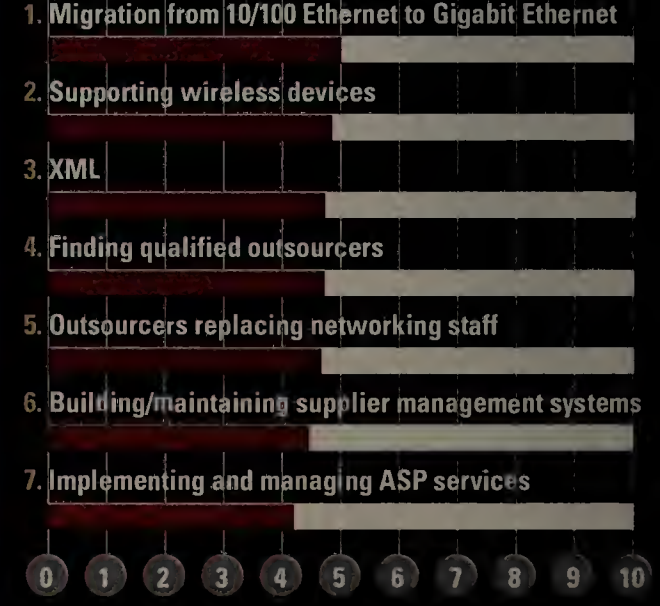
HOP ON TO NETWORK WORLD FUSION to download the full results. Plus check out your concerns broken out by job title.

Digging into the concerns
Of moderate concern

THE FOLLOWING AREAS ARE ON YOUR RADAR, but don't have you shaking. These job tasks scored a mean of a least 5 but less than 7.

Digging into the concerns
Of least concern

FROM MIGRATING THE NETWORK to choosing an ASP, these aspects of your job are the least of your concerns:



Fe NetIron

(480 Gbps)

The Fundamental Element For The World's Fastest Networks.

Foundry Networks introduces a new fundamental element in the Internet and metropolitan service provider universe — the NetIron Internet backbone router family. NetIron scales to 172,000,000 packets per second routing performance and 480 Gigabits per second switching capacity in a single system, making it one of the fastest backbone routers in the world. Its high density optical networking capabilities range from Gigabit Ethernet to Packet Over SONET at OC-3c/STM-1, OC-12c/STM-4, OC-48c/STM-12 speeds to ATM. NetIron also includes extensive redundancy into every aspect of mechanical, hardware and software design, and offers robust routing protocol support including OSPF and BGP4. All of which means the NetIron400, NetIron800 and NetIron1500 are essential in creating the world's fastest, most reliable backbone networks.

Call 1.888.TURBOLAN (887-2652), email info@foundrynet.com or go to www.foundrynetworks.com/nw1 to formulate your own opinion.

FOUNDRY NETWORKS

Your Job

CORPORATE PRESSURES
Now that everyone's job has to do with technology, are our roundtable participants in more demand?

"Not only are we in much more demand, but we have found that we are driven a lot more by the end users and in a lot more meetings with the end users."

Isaac Applbaum, CEO, Concorde Solutions

"The days of just having an IS shop that worried about systems and programming are over. Today you are worried about connecting all aspects of the company to the outside world."

Art Krulish, chief information officer, Aris Industries

Brett, it doesn't sound like you've got that problem, or do you?

Thomas: The more money we've spent on a solution and the more robust it is supposed to be, the more frustrating an experience I have had, because those tend to be complex systems, and most of the intelligence — most of the knowledge necessary to support them to the level that I would like — resides with the vendor. And so I have had infinitely more trouble with our Oracle systems and our Clariion disk arrays than with our Apache Web servers running Perl on Intel boxes.

How has e-business affected your job? Are you more visible, having to handle more work?

Applbaum: There are new solutions, concepts and ideas every minute. And just to stay on top of things — forget about getting ahead of them — we are working much harder and a lot longer. We have to be more creative, we need to be more competitive and adapt new technologies more rapidly. It's a tremendous challenge.

Krulish: E-business for us really is just in its beginning stages. For the most part, we were a wholesale distributor for large retailers. We are not really set up to do business like a catalog company, a small piece, onesy, twosy-type operation. We ship thousands of garments at one time. So most of our operations really have not kept up with the infrastructure to support an e-commerce environment. We deal with companies like CyberRetail that perform those functions for us. From an industry standpoint, my suppliers, especially in fabric, buttons, bows and all that, have not kept pace. The largest suppliers are moving toward it, but it's not been very fast for the apparel industry.

Glasberg: We are doing a lot of online government, where agencies figure out innovative ways to get their business partners online access to the back-end databases to do things like get gaming licenses. Now [my] people are really baselining and benchmarking applications so that we know what kind of service delivery we are going to be giving. Because an application that rolls out and can't run doesn't exactly make online government look good, we're working on network performance, network management and service-level management.

Springer: As far as how e-commerce has changed my job outside of my internal efforts, because everything I do everyday is e-commerce,

A.

WHAT HAS HINDERED mass deployment of B2B e-commerce?

"There is a large group of people out there that just made it into Y2K, never mind developed a tremendous e commerce and Internet infrastructure."

Art Krulish, chief information officer, Aris Industries

"Once the big players get in and start backing a model, then you'll really start seeing business to business take off."

Don Springer, vice president of Internet strategies, WholePeople.com

"E commerce really has just provided an easier way for us to have relationships with our vendors. But this has not been a wow we wouldn't be able to get this job done without this kind of thing for us so far."

Brett Thomas, vice president of technology, EMusic.com

we use e-commerce with our outside vendors in a relatively small fashion. For us, business-to-business has not been revolutionary. Our big suppliers have intranets. Instead of picking up the phone and calling to find out where an order is, we can check and see where it is. I can go on their Web sites and get their part numbers. But if I am going to do a big order where I don't know exactly what I want, I pick up the phone, talk to a salesman and have him take me out to lunch.

Glasberg: And negotiate price.

Thomas: And have a good feeling that I'm not getting the price that anybody who comes along on the Web site gets. When it comes down to it, I don't need to be going to my suppliers' intranets. I need to go to a marketplace and let all the suppliers bid on my business, but [business-to-business e-commerce] hasn't gotten that far.

Switching tracks here, how are you dealing with the employee shortage?

Applbaum: We're aggressive. We pay well. We have been able to differentiate ourselves in the type of technology that we are using and implementing. I find that if you keep the work exceptionally interesting, then you don't have to buy them a BMW or something like that.

Springer: We focus on retention. If you get a superstar, a talented, technical person, it kills you when you lose him or her. So I let those people get trained, promote themselves, take on responsibility and go in new directions so they can manage their career within our company as opposed to taking off when the next best opportunity comes around.

Have people stopped job-hopping just to get bigger salaries?

Thomas: Well, 30% of my global head count is unfilled right now. It's the shortage, but another part of it is that people are buying into their companies' futures by signing stock option agreements. They are saying, 'OK, if I hang out here, I am guaranteed a lot more money every quarter as my options vest than anyone is going to offer me in cash. And not only that, I get to pay lower taxes on it because it's a capital gain, if I've done things right.'

The other thing on retaining people, the way you lose superstars is by not doing it right. They get miserable, so go out and find a job that's fun. If we keep those people happy, the ones who end up job-hopping are the ones who aren't any good.

Krulish: I agree 100%. It's got to be fun. Give them things that they want to do while steering them into things that are beneficial to the company. If you offer normal salaries, good benefits and keep these guys creative, there are times when it's 10, 11 at night and these guys are still hammering out things. They're excited. They're happy. That's what keeps good people.

Thomas: But on the 10 or 11 o'clock point, my feeling is, even as a start-up, we shouldn't be scheduling for more than 45 hours a week. But if we set the environment up right, we are not going to be able to pry them away from their desks, to go home and take a shower or to get another job.◪

DocFinder: 9024

More online www.nwfusion.com/you2000

HEAR THESE IT EXECS discuss other hot technology, management and business issues. We've captured their thoughts in RealAudio, and give you the chance to zero in on the topics most relevant ot your job.

And points in-between.

One call to Viatel can take you from here to there, with as many stops as you need to make along the way. It's that simple. Viatel delivers end-to-end connectivity today between more than 60 major business centers and 250 points of presence, all across its own, integrated Pan-European, North American, trans-Atlantic and metropolitan fiber networks.Innovative pricing. Fast provisioning. Five-nine reliability. All on one network built to move at the speed of light. When you're considering a wavelength, bandwidth or dark fiber partner, select Viatel. We're ready to take you from where you are to where you want to go.

VIATEL®

The Future of Telecommunications Is Here.

Viatel from anywhere in Europe **00800.0064.4444**

Viatel in the U.S. **1.800.528.1660** **www.viatel.com**

© 2000 Viatel, Inc.

EVERYTHING TELECOMMUNICATIONS

EVERYTHING NETWORKING

TelekomNet

Telecommunications & Networking Hub
www.telekomnet.com

Your Future

THINGS, THEY ARE A CHANGIN'
Knowing your packets and protocols won't get you far these days, industry watchers and IT professionals say:

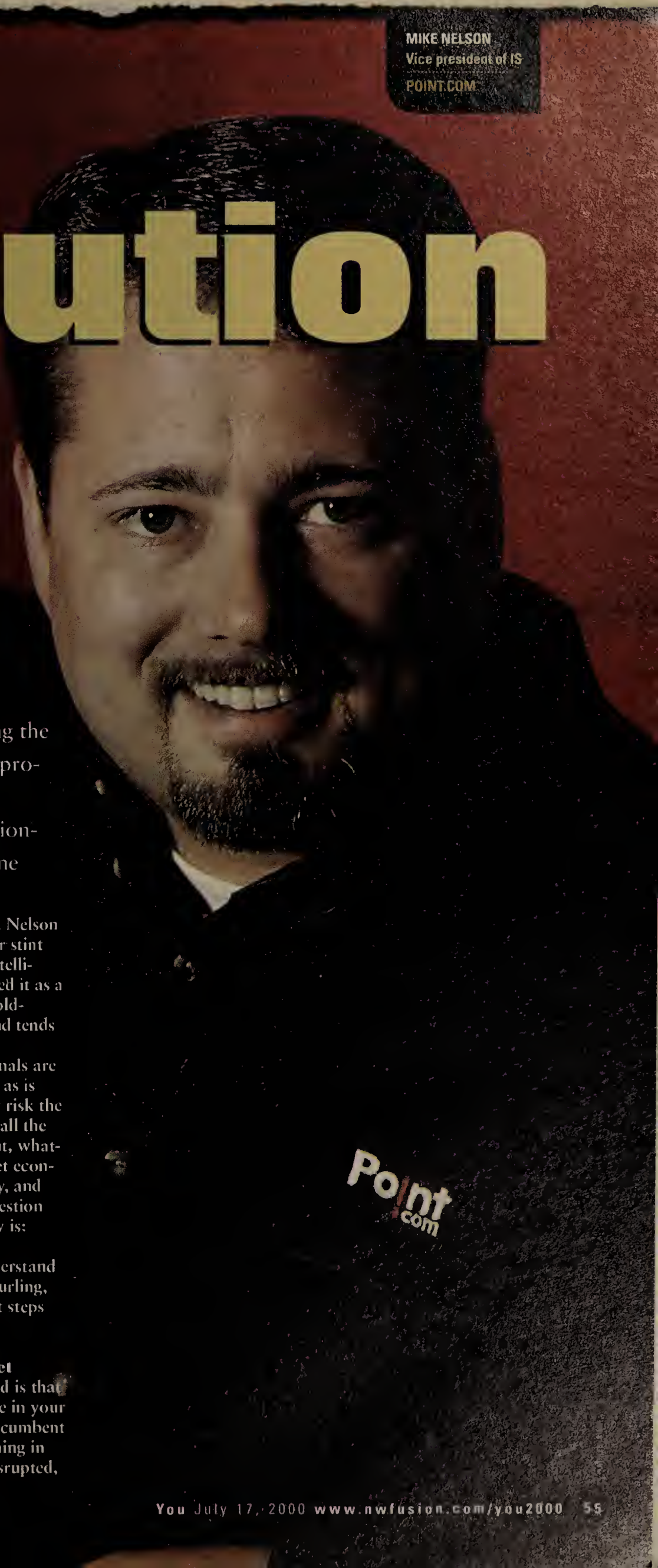
"Several years ago, we were saying the best way to build an IT career was to maintain technical skills. These days, it's figuring out how to fit technology into the company's value chain."
Peter McAteer, vice president and managing director, Giga Information Group

"CIOs and network executives have to be open, flexible and creative about how to take advantage of evolving services and capabilities."
John Daily, managing director, Christian & Timbers, an executive search firm

Your e-volution

THE INTERNET ECONOMY HAS CONJURED UP A WORLD OF CAREER OPPORTUNITIES. DO YOU KNOW HOW TO GRASP THEM?

By Beth Schultz



Talk about a birthday present. Just days before turning the big 3-0, Mike Nelson reached a career height to which professional peers twice his age often aspire.

He hit the executive ranks responsible for a multimillion-dollar budget, as vice president of IS at Point.com, an online retailer of wireless phones, service plans and accessories.

"So what," you say. "Point.com is just a little Internet start-up." But the company's IT accomplishments are nothing to sneeze at. Last year, it won the Inc./Cisco Growing with Technology Award for use of network technology. In 1998, *BusinessWeek* named it one of the seven best Web sites of the year. In an endorsement of its new business-to-business strategy, in May Motorola invested $15 million in the privately held, 5-year-old company.

Plus, Nelson has faced management and technical challenges that would test the most seasoned network professional. He's had to rejuvenate a tired technology team, hire dozens of workers, plan a $10 million budget and implement a systems and network architecture that would let Point.com enter new markets painlessly, all while selling potential customers on the company's technology vision. And he's only been at Point.com for one year.

Despite the stress, Nelson loves every minute in the dot-com world. He's highly motivated, ambitious and too impatient to work within the confines of a traditional IT department. Nelson left Microsoft after a three-year stint developing internal business intelligence systems because he viewed it as a footdragger. "Microsoft is an old-school technology company and tends to be a bit slow," he says.

Clearly, not all IT professionals are as enamored with the Internet as is Nelson. Some of you wouldn't risk the safety of an enterprise job for all the stock options in the world. But, whatever your druthers, the Internet economy is affecting your company, and therefore, your career. The question you've got to ask yourself now is: "Will I be helped or hurt?"

To answer, you need to understand what IT opportunities are unfurling, where you fit in best and what steps you need to take now.

Can't sidestep the Internet

The first thing to understand is that even if the Internet doesn't rule in your industry today, it will soon. Incumbent companies that don't do anything in the Internet are going to be disrupted,

HAPPY WHERE THEY ARE **Move to a dot-com? No way, say these IT executives. They have their reasons for staying put:**

"I think that like everybody who's involved in networking, I've seen the value of my job increase within the corporation. Certainly I'm much more involved in the business than I used to be."
George Yeager, manager of architecture and design, Columbia Energy Group Service

"As my career has progressed, I've developed stronger relationships with senior managers and others in the company. Management provides tremendous support for IT initiatives. It's aware of what IT can bring to help distinguish us from our competitors and add value to customers."
Steve Walsh, managing director of IT, GATX Rail

says Jeffrey Elton, managing principal at Integral, an international consulting firm in Cambridge, Mass. Disruptive technologies are akin to Moore's Law. They change the paradigm so that the old way is no longer valid. Internet entrants are doing everything they can to be disruptive quickly, and they have the advantage. Their new business models are fast and flexible, easily adaptable to take advantage of new opportunities.

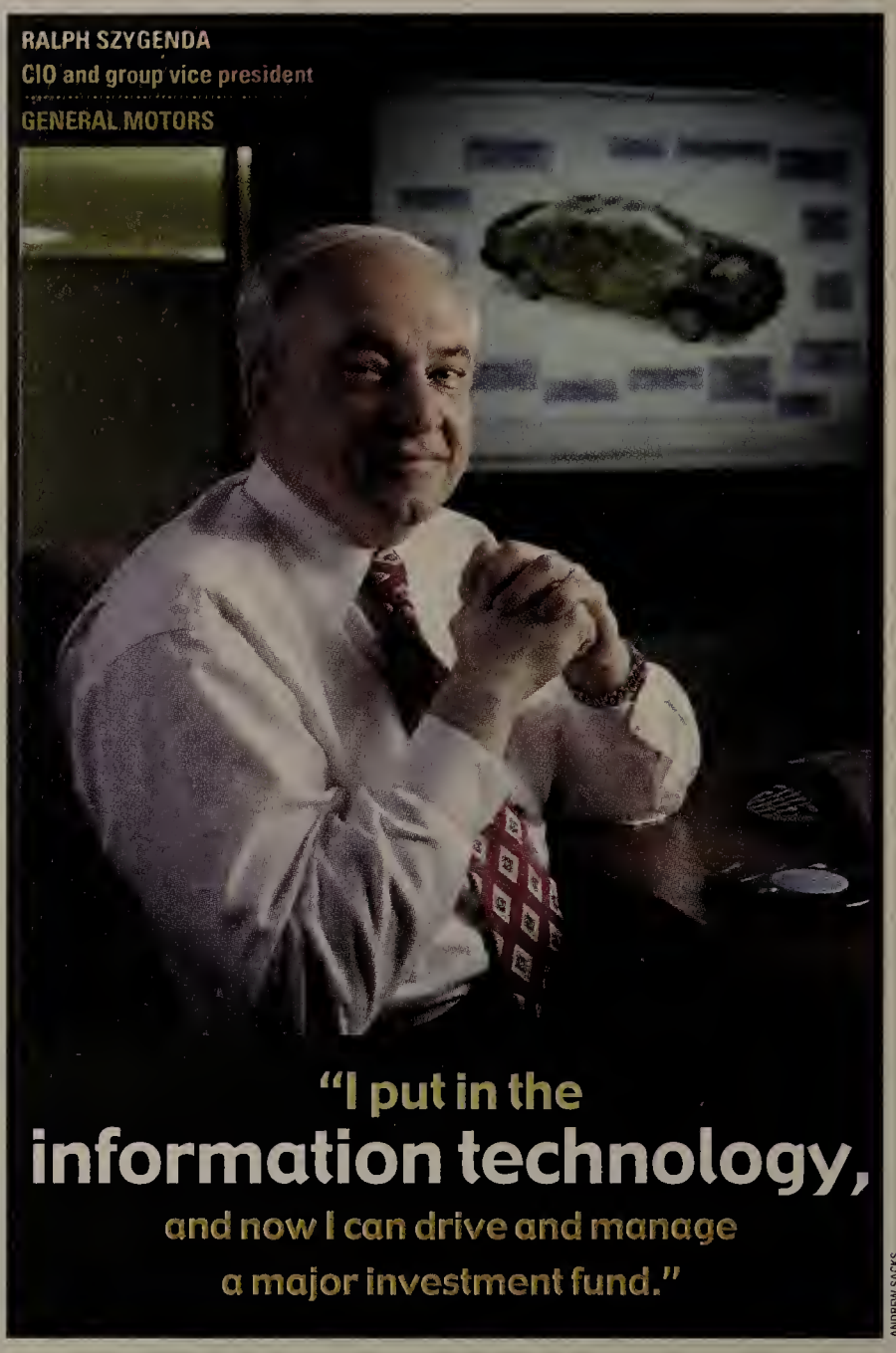
If you've got tenure and a sense of ownership at your old-world company, your best bet is to lead your employer into the Internet economy. Chances are, your senior management is grappling with how best to take advantage of the Internet. It's your professional and ethical responsibility to participate in, if not lead, those talks, Elton says.

As an IT executive, he advises you must facilitate, even stimulate, discussions on:

- What lines of business to Internet enable and how.
- What interfaces to customers and suppliers to Webify.
- Whether the company can disrupt itself by taking advantage of a substantially different business model provided by the Internet.
- Whether the Internet opens new business opportunities.

If you're successful in repositioning your old-line company as an Internet player, you'll find yourself exerting considerable authority. That's been the case for Ralph Szygenda, chief information officer and group vice president at General Motors. He oversaw the re-engineering of GM from a traditional automotive company into an Internet powerhouse. E-commerce accounted in part for GM's strong financial showing in 1999. The company reported a record $176.6 billion in revenue for the year, up 13.6% over 1998 revenue.

Szygenda lords over a $3.2 billion budget; he's spent $1.6 billion on e-commerce applications and Web hosting in the last three years. Even so, he's reduced IT spending from 1996 to 1999 by $800 million. With those savings, he's created a venture fund. "I put in the information technology, and now I can drive and manage a major investment fund."



Talk about a career booster. By managing a major investment fund, he has the power to finance the development of emerging technologies or pay for their acquisition. For example, GM invested $15 million in General Magic for hands-free voice, a technology that offers obvious market advantage to a car manufacturer. Other CIOs — from old-line or dot-com companies — would find it hard to match the authority Szygenda has.

Another well-known tale of success is Dawn Lepore, who as CIO led investment firm Charles Schwab on to the Internet. Last July, she was awarded the title of vice chairman — a big acknowledgment of the role she played in turning the company into the premiere online trading firm. *Network World* has repeatedly chosen Lepore as one of the most powerful people in networking in our annual Power Issue, and *Fortune* considers her one the most powerful women in business.

Clearly, success in transforming your company into a New Economy player will cement your career at the top. Seasoned IS executives who have proven their Internet mettle are in big demand.

At Federal Express, an Internet trailblazer that deals with 70% of its customers online, Dennis Jones is executive vice president as well as CIO. He plans to parlay that senior management experience into a CEO spot when he retires at year's end.

"I'll be retired for a nanosecond," quips Jones, who has held the CIO spot for 10 years. "But I don't see myself taking on a CIO role. I see myself taking a broader leadership role."

Jones says he's received his share of job pitches, and that he felt it necessary to announce his retirement nine months in advance to stave off recruiters who were gunning for his replacement, Robert Carter, senior vice president and chief technology officer at FedEx. "I had a worthy successor who was receiving substantial offers from other firms. I needed to announce our succession plan," he says.

When to hit the surf

If your executive team hasn't been willing to listen to your ideas on e-business, is outright ignoring the Internet or is moving too slowly to capture the opportunity, then your responsibility is to yourself. Clear out of there before your career fizzles, Elton advises. Staying at a company that gets left behind because it has overlooked the Internet can result in you being served up as a scapegoat.

If that's the case or, if like Jones, you have already guided your company into the dot-com world, chances are you're dreaming of an Internet start-up as your next challenge.

No doubt, dot-com offers can be compelling: instant senior management status — perhaps even the CEO slot — meaty stock options, a plentiful IT budget. But such job offers are often a Trojan horse. You'll be working long, hard hours for an immature company using an unproven business model chasing uncertain customers. You might be CIO or CEO one day and out of a job the next. Even with good funding, far more start-ups fail than succeed. That

See E-volution, *page 58*

Are you ready to be an Internet economy leader?

EXECUTIVE SEARCH FIRM **Christian & Timbers recruits technology executives for traditional and dot-com companies. John Daily, managing director of the firm's technology practice, has these four criteria to determine if you've got the makings of a New Economy CIO:**

1. You understand how e-commerce and new Internet media can be used to boost a company's bottom line.
2. You chose technologies because they add value to the business, not because they're the latest and greatest, or provide a challenge for your staff.
3. You're willing to outsource and offload applications and functions you traditionally have done in-house.
4. You thrive in fast-paced, dynamic environments.

Novell.

DIRECTORY ENABLED

Ideas take wing with Novell and IBM.

IBM

IBM Netfinity ServerProven

Flight ready. That's the kind of solution you need to power your e-Business strategy in the Net economy. It's simple. You need compatibility with your current IT infrastructure. You need reliable solutions that install and integrate smoothly. And you need to know where to get plug-and-play solutions that will accelerate your e-Business transformation.

For starters, look for solutions that are Novell®Directory-Enabled and IBM Netfinity ServerProven™. They are the marks of a Net tested and proven solution for Novell NDS® eDirectory™ and IBM® Netfinity® servers. And it's the simplest way to enable yourself. Find proven and enabled solutions that will unite your Net at: **http://developer.novell.com/enabled.**

Novell®

© 2000 Novell, Inc. Novell and NDS are registered trademarks, and eDirectory is a trademark of Novell in the U.S. and other countries. IBM and Netfinity are registered trademarks, and ServerProven is a trademark of IBM in the U.S. and other countries

CIO OUTLOOK **Thoughts on chief information officers:**

"Today, I have a few jobs. One is CIO. Another is chief Internet strategist. And the business to business development of ventures is mine, too."
Ralph Szygenda, group vice president and CIO, General Motors

"We're finding that the CIO has less influence on the thinking of the Internet group than we would like. We're not seeing them get the chief information officer positions, and that's a problem. We're seeing 80% of them move more toward operational roles than strategic ones."
Jeffrey Elton, managing principal, Integral

"As a CIO, I view myself as someone who understands how to apply technology to solve a business problem. I understand both sides — I'm a calico person."
Dennis Jones, CIO, FedEx

Continued from page 56

means career crash.

That was always what concerned Michael Ford when he listened to dot-com job pitches. As CIO at Best Western International, he heard a lot from folks forging online hospitality ventures. These entrepreneurs talked about using leading-edge technologies, yet didn't have scalable systems. They promised to deliver functionality to customers that was in no way feasible. And they lacked creative business approaches, Ford says.

But Ford finally got an offer he couldn't refuse: chief technical officer (CTO) of PurchasePro.com, a Las Vegas e-marketplace provider. "The founders knew they did not have the infrastructure to support hundreds of thousands of users, and they needed me to redevelop and re-engineer the system," he says. "My three concerns were literally the challenge that led me to a dot-com."

One of the unbeatable positives about becoming top technology dog at a dot-com is that most everyone understands the importance of your role. They know without good technology, the company's toast. "In traditional companies — even the most progressive — technology is still used just in support of the business. "In the Internet, it is the business," Ford says.

That's good for your ego, but it also redraws the battle lines. Instead of spending your time explaining and justifying technology expenditures to your CEO and board, you're an integral part of your company's overall business strategy.

Ford and Point.com's Nelson, for example, each say they joined their respective dot-coms in part because technology and the corporate vision were intertwined — meaning they're in the thick of the business. "With a dot-com, especially one engaged in business-to-business [e-commerce], you get to be a company spokesman. That gets me jumping out of bed in the morning," Nelson says.

SAMPSEL/PRESTON PHOTOGRAPHY

Groomed for CEO

Ford and Nelson see their futures much differently now that they've moved into the dot-com world. They find themselves immersed in making business plans and corporate strategies, and the intimacy with those operations has prepared them well for a move into the corner office, they say.

Nelson has given himself six years. Maybe he'll become a CTO first, taking on more business responsibilities than he has as a vice president, he says. Maybe he'll launch a firm of his own and take on the CEO role.

Ford dreams of entrepreneurship, too. "My next step, if I decide to pursue it, would be developing a technology company and running it myself," he says.

Of course, dot-coms aren't the only companies begging for good IT talent. The more risk-averse might opt for top technology slots in traditional companies with solid histories and unquestionable futures. Such a company would understand how to play in the New Economy, or at least recognize its importance and need you to get it there.

A top executive slot is not the only measure of a successful IT career these days. "It's a mistake to suggest that someone who doesn't have a career path to CEO has had a disappointing IT career or a career that's over. People have had their own passions, and they have to follow those," says Peter McAteer, vice president and managing director of Giga Information Group's Organization and Workforce Planning ePractices service in Cambridge, Mass.

For some, establishing operational procedures in the data center is more rewarding than plotting corporate strategy in the boardroom. That type of job is still important. "But, it's woefully insufficient for the type of technology leadership companies need for new business models," says Integral's Elton, who co-authored a *Harvard Business Review* essay with McAteer on the topic "Are CIOs obsolete?"

Eventually, Elton and McAteer say, if you favor operational procedures over business strategies, you'll find yourself weeded out of user organizations playing by New Economy rules. Not to worry, though. You'll have great career opportunities within a wildly growing infrastructure industry spawned to support all those new dot-com and Internet-related business models — job opportunities are ripe at application service providers (ASP), content delivery network providers and Web-hosting firms, they say.

But forget that grand career plan you developed years ago. If you can expand your lens, then where you go can be different — maybe into other parts of an organization or to an ASP, for example. Remember, Elton stresses, "Nothing here is about death, but change."◪

Growing for e-business

A LOOK AT HOW three companies have beefed up their staff to meet the technological demands of their Internet strategies:

- Automotive behemoth General Motors hired a chief information officer, Ralph Szygenda, who then populated his technical talent pool with 200 top-level information officers, 1,500 technologists to report to them and thousands of people as outsourcers. (Of course, this hiring craze followed GM's decision to spin off EDS, which had long provided information services for the company.)

- Business-to-business e-commerce site Purchase Pro.com brought in a chief technical officer, Michael Ford, who then hired a CIO and added about 120 IT professionals. That brought the technical headcount to 150. Hiring was heaviest for people with skills in Java development, infrastructure and technical project management.

- Online wireless retail site Point.com hired a vice president of IS, Sharon Ballgae, and a director of software engineers, Mike Nelson. Within a year, Ballgae became executive vice president responsible for all corporate operations and Nelson moved into the position she vacated. He's grown the technology team from 12 to 72 in eight months and expects to have100 direct reports soon. The hires are application developers, program managers, business and systems analysts, network and infrastructure specialists, quality assurance engineers, and a configuration management group.

— Beth Schultz

Service Management for Improving Performance.

Manage Your Applications

- Visual Trinity™
- Visual TDSLink™

Manage The Web

- Visual eWatcher™
- Visual Benchmark™

Manage Your Services

- Visual UpTime®
- Visual IP InSight™

PERFORMANCE ISN'T JUST ABOUT SPEED. It's about how well your network works, end-to-end. As the market leader in service management, Visual Networks offers solutions for Service Providers and Enterprise customers that increase network reliability, dramatically reduce operational expenses, and lower total cost of ownership. Regardless of application. Regardless of transport technology.

That's the kind of performance you should expect out of your network. And your service management company.

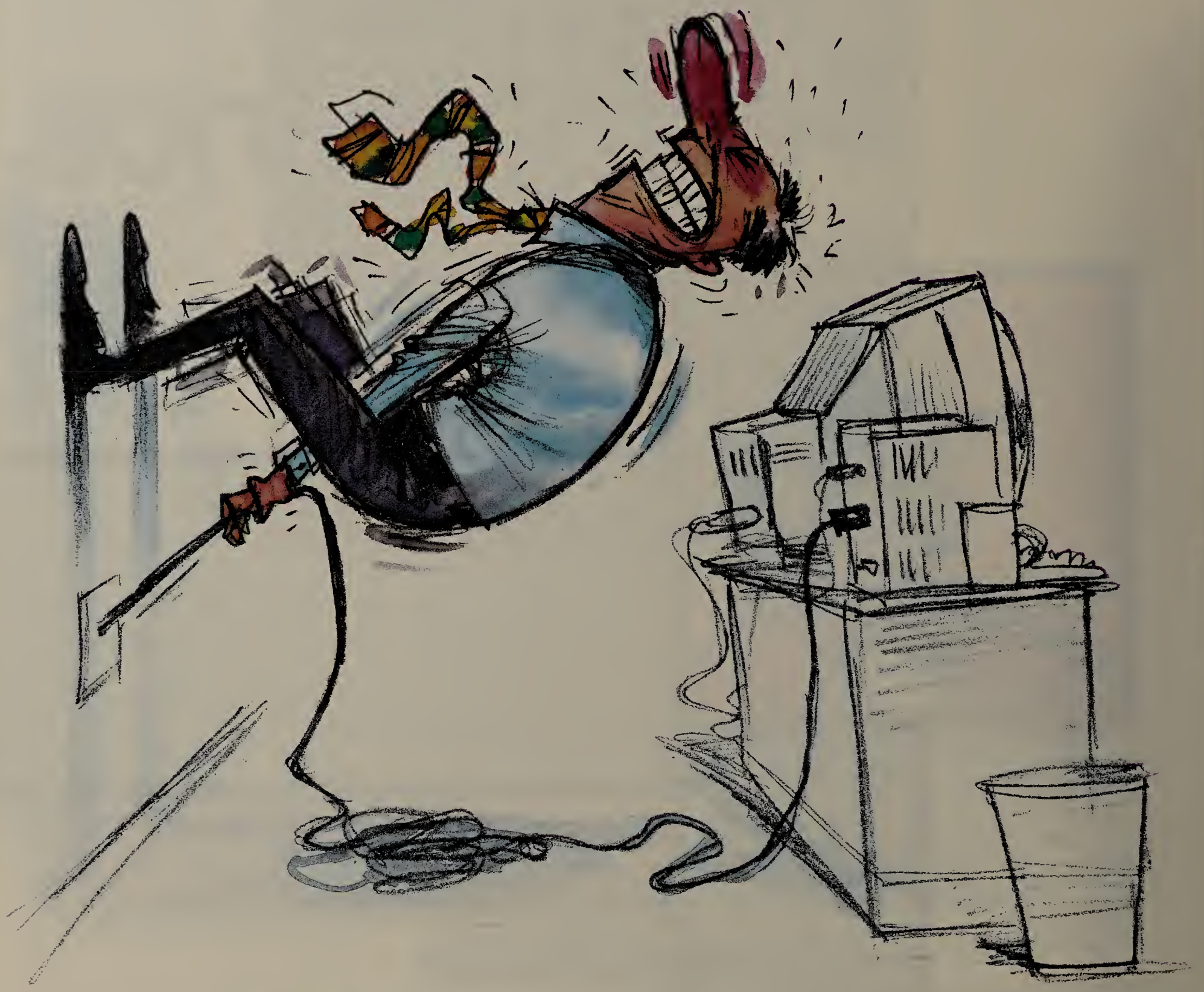
To learn more, call **1-800-240-4010** or visit **www.visualnetworks.com/nw** for a copy of our white paper, "Managing Service Delivery Across the Internet Infrastructure."

VISUAL NETWORKS®

www.visualnetworks.com/nw

©2000 Visual Networks Technologies, Inc. Visual Networks and Visual UpTime are registered trademarks of, and Visual Benchmark, Visual IP InSight, Visual Trinity, Visual TDSLink and Visual eWatcher are trademarks of Visual Networks Technologies, Inc.

"Dial-up access is too #!! slow!"



Internet dial-ups and endless downloads can drive anybody up the wall.

Your company needs always-on Internet. Instant site-seeing. And when you have a service problem, or just a question, you want to talk to a real human being with real solutions.

You can have it all, just by switching to LIGHTPATH. We provide complete voice, data and Internet communications over our own fiber-optic network. By combining your Internet service with your local carrier, you get the highest reliability and the best network performance.

So call 1-877-LIGHTPATH. Or visit www.lightpath.net. We'll explain how LIGHTPATH can cut your phone bills up to 30%. And help get your business back on its feet.

LIGHTPATH®
A Service of Cablevision

Voice. Data. Internet. Real human beings.℠

www.lightpath.net

LIGHTPATH LONG ISLAND CLASSIC
July 24-30, 2000

Your Salary

YOUR SKILLS IN 2005 On a 1-to-3 scale, here's how 175 You survey respondents ranked what job skills will be most important in five years.

- Business management (forecasting, budgeting, project management). 2.33
- Mastering emerging technologies (XML, all things IP, broadband) 2.58
- Choosing and managing outsourcers (negotiation, SLA management) 2.03
- Ability to integrate (integrating existing systems with e business systems) 2.61
- Continuation of current skills (network management, assessing new technologies, troubleshooting). 2.43

IMPORTANCE
Most = 3
Moderately = 2
Not important = 1

Getting your due?

OUR 2000 SALARY SURVEY SHOWS THAT TOTAL COMPENSATION IS STARTING TO REFLECT THE INCREASED IMPORTANCE OF NETWORKING.

By Denise Dubie

In her 15-plus years in the industry, Deb Brenamen, IT liaison manager for Midwest manufacturing company New Venture Gear, says she has witnessed a significant shift in upper management's attitude toward the network professional.

"Companies are finally starting to pay attention to technical employees as more than just a necessary evil," she says. "These employees bring a lot to the table in terms of business systems, and employers are changing things to be more competitive."

This increased recognition is translating into healthy increases in total compensation for network professionals, according to our annual Network World Salary Survey. The average base salary of the 3,702 network professionals who participated in the survey rose from $61,618 in 1999 to a projected $65,997 in 2000, an increase of 7%.

But that's not even the best part. Total compensation has gone up dramatically, fueled by hefty bonuses and stock options, from $63,050 in 1998 to $73,141 in 1999 to $80,235 in 2000, according to analysis of the survey results by STAT Resources, a research firm in Brookline, Mass. For the survey,

The current picture

COMPENSATION for IT professionals in 1999 and now

	1999 actual	2000 projected
Base salary	**$61,618**	**$65,997**
Bonus	**$5,193**	**$6,670**
Stock options	**$5,210**	**$6,497**
Other	**$1,120**	**$1,071**
Total	**$73,141**	**$80,235**

STAT sent e-mails to a random sample of *Network World* subscribers requesting them to participate in a private online survey. STAT then analyzed the raw data.

Per that data, your average annual bonus increased 28%, from $5,193 in 1999 to an anticipated $6,670 this year. Stock options increased 24%, from $5,210 in 1999 to a projected $6,497 this year. The percentage of respondents who expect to receive additional compensation in the form of stock options and bonuses increased from 46% to 56%.

Sherry Callahan, senior network administrator at financial services firm State Street, in Kansas City, Mo., is enjoying the changes to her paycheck. She received a 15% salary increase last year and reports another 19% for 2000, on top of a four-digit bonus due later this year (see related story, page 66).

Of course, not all of you will see that large an increase, depending on your title, the size of your company, your location and perhaps even your gender. But the numbers don't lie: Compensation in the network industry is on the rise due to the emergence of new, complex technologies like VPNs and voice over IP, the increased importance of e-commerce and a shortage of skilled workers.

Your Salary

YOUR THOUGHTS ON TECHNOLOGY **A total of 175 You survey respondents picked the following technologies as having the most impact on networking in the next five years. They ranked them on a 1-to-5 scale:**

The Web is clearly the hot place to be. If you can successfully create, design and maintain a dynamic Web site, your average salary is $83,000, but in terms of total compensation, you're pulling in about $106,000. Internet, intranet, e-commerce and Web managers — all relatively new positions in the industry — are in demand, and their average paychecks are more than 50% higher than network managers, who average about $61,656 per year.

Most respondents predict the salary gap will narrow over time. While those in non-Web positions may express a bit of jealousy about the high salaries going to people in online positions, they also understand the big bucks may be justified.

"I think it takes a pretty creative person to be a Webmaster," says Brett Carlsen, a systems analyst with Kings County in California.

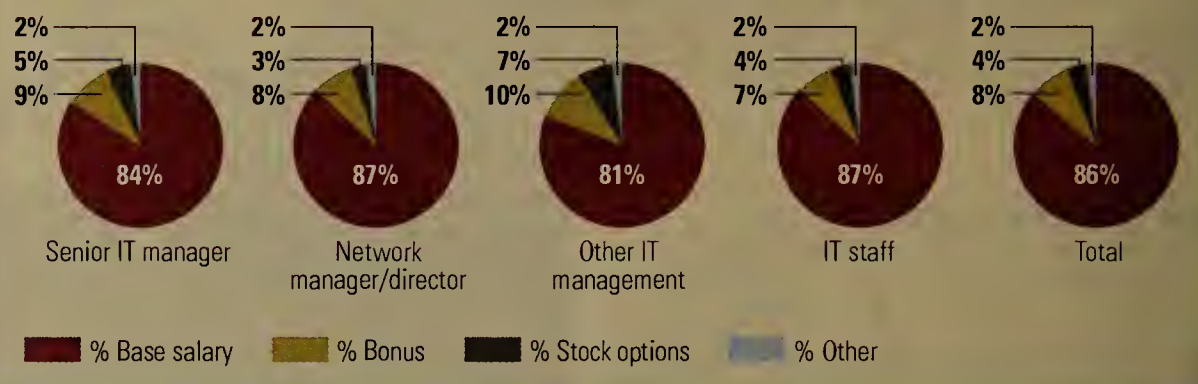
With 17 years in this industry, Carlsen says it can be frustrating to work with one of these Web gurus, fresh from college, making double your salary. But Carlsen also admits his experience may be dated.

"In this industry, longevity does not necessarily justify a higher salary," he says. "Some of the stuff I learned years ago is no longer applicable. That makes part of my job skills obsolete."

Components of 1999 pay based on number of employees

	LESS THAN 1,000	1,000 - 9,999	10,000+	TOTAL
Base salary	$54,303	$58,077	$64,121	$61,618
Bonus	$4,112	$4,157	$5,233	$5,193
Stock options	$2,409	$1,593	$9,264	$5,210
Other	$833	$1,038	$909	$1,120
Total	$61,657	$64,865	$78,628	$73,141

SOURCES OTHER THAN BASE SALARY now account for about 14% of total compensation



The management track

Another way to boost your pay is to move into a management role. For example, a LAN, WAN or network manager makes about $61,656 per year, while the average help desk or tech support person makes approximately 27% less at about $48,500. From the top of the management ladder down, those in charge are earning significantly more.

Of course, chief information officers make the most at about $112,479, but other managers pull in some great packages, too. Telecommunications managers, for example, are averaging about $74,843, and others in IS management take home approximately $76,690, while those on network staff make about 23% less at $62,152.

1999 salary and predicted total compensation by title

Management	BASE SALARY	PROJECTED TOTAL COMP.
Chief information officer	$112,479	$188,056
Senior vice president (MIS/IT/IS/DP)	$101,024	$184,463
General management	$101,968	$122,839
MIS/IT/IS/DP technical director	$69,238	$80,656
LAN/WAN or network manager	$61,625	$67,905
Telecommunications manager	$74,843	$88,443
Internet/intranet/e-commerce/Webmasters	$82,840	$106,290
Other IS management	$76,690	$103,151
Technical support management	$74,860	$140,828
IT assistant managers/supervisors/coordinators	$53,139	$85,861
Security/information/security management	$70,000	$83,571
Staff		
Network architect/designer/analyst/database administrator	$67,091	$82,641
Network operator/technician/other network operations staff	$50,754	$57,800
Trainer/help desk/tech support	$48,471	$52,742
Other staff	$62,152	$68,061
Engineering staff	$63,000	$73,647
Network administrator	$52,813	$60,938
Security staff	$67,917	$73,833
Consultant/consulting manager	$78,938	$95,906
Project/program/engagement managers	$79,267	$90,700
Engineering/architectural managers	$94,045	$124,818
Other engineers (IS)	$75,631	$92,000
Other software developers/programming analysts	$60,868	$65,632
IS administrators	$54,577	$82,731

Bigger is better

Working for a large company is another way to increase your earnings. Survey results show the base salary for staffers in companies with 10,000 or more employees is $64,121. That's 10% more than the $58,077 average base salary for respondents in companies with 1,000 to 9,999 employees, and 18% more than the $54,303 average base salary at companies with less than 1,000

See **Salary,** *page 64*

Endless Possibilities. Younique Solutions.

Your challenge is to turn possibilities into profits. But your success depends on being able to exchange information with your customers — reliably, securely, safely. Who can make it happen? You can — when you bank on SAVVIS. You need an IP network that's always on, 24x7. And SAVVIS delivers, enabling you to launch new applications with complete confidence. In fact, 75 of the top 100 worldwide banks and 45 of the top 50 brokerage firms trust the SAVVIS network. So should you.

Intelligent IP Networking for Dynamic Companies℠

SAVVIS

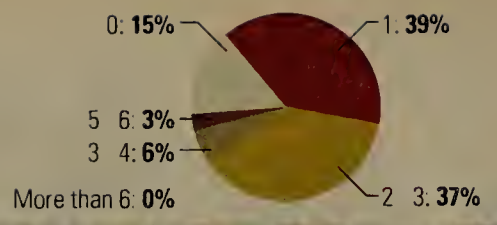
www.savvis.net/thrive

© 2000 SAVVIS Communications. All rights reserved.
All trademarks property of their respective owners

Your Salary

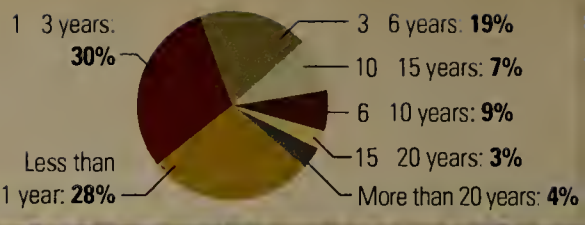
YOUR JOB HISTORY Here's a look at how many companies, besides your current one, you've worked at in the last five years:

(175 You survey respondents)



And here's how long you've worked at your current company:

(180 You survey respondents)



BRIAN DRESSLER/MPG

Continued from page 62

employees (see graphic, page 62).

Large companies also offer more in the way of stock options. The largest companies offer $9,264 in stock options, compared to $1,593 for midsize companies and, interestingly, $2,409 for small companies.

In terms of total compensation — bonuses and other benefits included — the big boys average out at more than $78,000, leaving midsize and small firms paying 21% and 27% less, respectively, to the average network staffer.

Location, location, location

It's not only what you do, but also where you do it that impacts your compensation. This year's survey shows if you work for a company located in the Pacific, Mid-Atlantic or New England regions, you make more than your counterparts elsewhere in the country (see graphic, below). The average pay for an IT employee in the Pacific region is $82,969, almost 12% more than the national average for those positions.

Typical work week

	NETWORK MANAGER	IT STAFF
Office	45.3	40.9
Home	6.6	5.4
Other locations	2.5	3.9
Total	54.4	50.2

On the other end of the spectrum, those of you in the East South Central region — Alabama, Kentucky, Mississippi and Tennessee — are making about 23% less than the national average, bringing in only $56,884 on average for the same positions.

"The East and West coasts are the best places to get paid, unless you're contracting, because then all the places that no one wants to go, pay the best," says Hal Norman, IT manager for a wholly owned subsidiary of a large aerospace company. Because Norman's company is headquartered on the East Coast and he works for

See Salary, *page 69*

Salaries mapped by region

OVERALL PAY in the Pacific and Mid-Atlantic regions runs about 12% above the norm, while the East South Central region averages nearly 23% below.

Endless Possibilities.
Younique Solutions.

Your business potential may be brilliant. But your success depends on how fast you can get to market. Who can make it happen? You can — with the help of SAVVIS. As easy and instantaneous as flipping a switch, you can create cost-effective customized IP networks on demand. Just go on-net with SAVVIS, and deploy private IP networks for your extranet, intranet or any application you choose. With your built-to-order private IP networks, there are no limits to what you can do.

Intelligent IP Networking for Dynamic Companies℠

SAVVIS

www.savvis.net/smart

© 2000 SAVVIS Communications. All rights reserved.
All trademarks property of their respective owners.

YOUR FAVORITE JOB PERKS
(174 You survey respondents)

For most of you, playing with new technology is your favorite perk. But some say these items are the best:

- "Ultimate power over the network."
- "Telecommuting."
- "Great people, very challenging work."
- "Season tickets to the symphony."

For others, the simple things work:

- "Casual environment."
- "Office with a window."
- "Free coffee."

Should you stay or should you go?

The latter, it seems, is often the answer for IT professionals. Loyalty is on the decline, even though salaries are on the rise, finds the *Network World* Salary Survey.

While the number of people who say they can't envision changing jobs in the foreseeable future remains at about 11%, the number of people actively looking for a new job has risen from 46% in 1998 to 52% in 1999 to 56% this year. And the percentage of women looking for new jobs has risen from 43% last year to 63% this year.

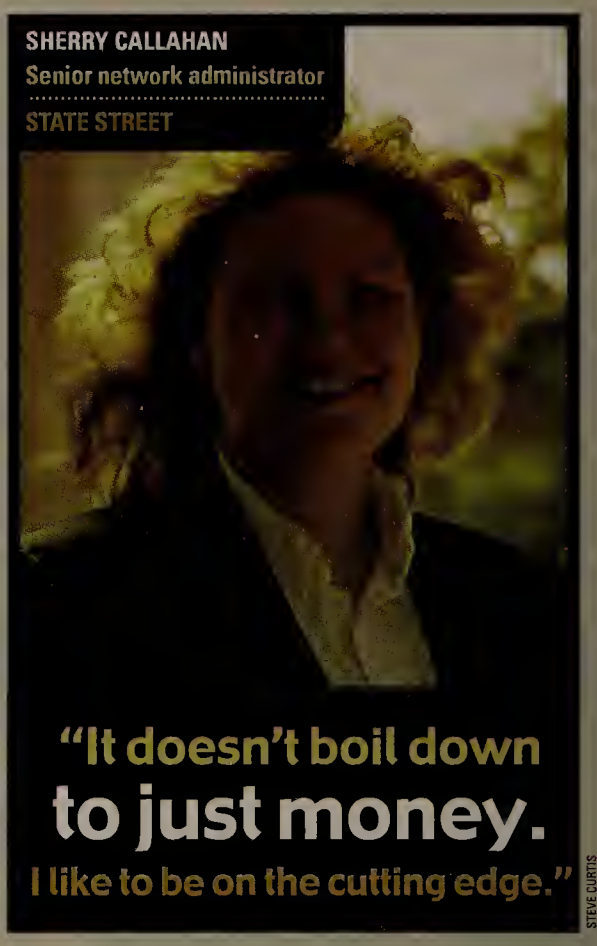
So what does this year's survey tell us about what's important to you in terms of your work? If you're a manager, what does the survey say about how you can do a better job keeping your top employees?

Job seekers are more interested in tuition reimbursement, increased responsibility, advancement potential, salary, bonuses, professional development and training than loyalists are.

The latter is tough, notes Sherry Callahan, senior network administrator at State Street, a global financial services firm. "A company really goes out on a limb with training. It's nice to help employees beef up their resumes, but it's also a risk that the employees may leave," she says.

Callahan, who has worked in State Street's Kansas City, Mo., location for three years, recently received an outside job offer that guaranteed her a $11,000 signing bonus, two more weeks vacation and virtually complete autonomy. But she refused.

"It doesn't boil down to just money. I like to be on the cutting edge. I don't want to be in a position that will become stale," she says. "State Street allows me to always be working with new technology. It's very committed to the IT field."



At the other end of the spectrum, loyalists differ from seekers in that they are more concerned with the type of industry they're working in, proximity to home, family friendliness, stock options, autonomy and flexible work schedules.

"Because I'm diabetic, I have made a choice not to put in too many hours," says Hal Norman, IT manager of an aerospace subsidiary. "My boss is happy as long as we are getting everything done as it needs to get done." It's that kind of autonomy and trust Norman receives and greatly appreciates.

Loyalists and seekers also have much in common. They agree on the relative importance of overall compensation, access to new technology, recognition, job security, benefits and the opportunity to telecommute.

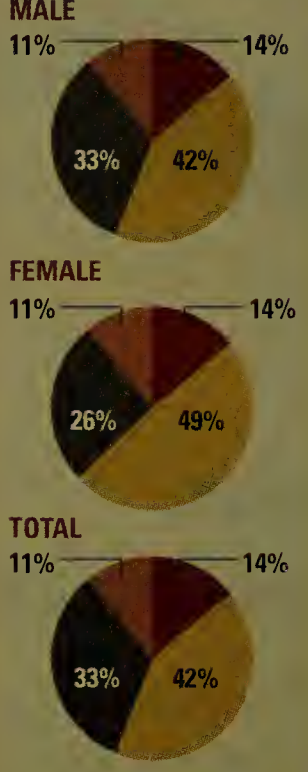
Finally, when it comes to the factors that employees say are most important about their jobs, the challenge of work comes out on top, at 94% for job seekers and 91% for loyalists. Overall compensation is second at 92% for seekers and 90% for loyalists, and access to new technologies is third at 91% for seekers and 90% for loyalists.

— Denise Dubie

Seekers and loyalists

A quick look at how important seekers and loyalists perceive various job characteristics.

	SEEKERS	LOYALISTS	DIFFERENCE
Tuition reimbursement	50%	39%	11%
Increased scope or responsibility	59%	51%	8%
Advancement potential	85%	78%	7%
Base salary	87%	81%	6%
Performance incentives/bonuses	76%	70%	6%
On-the-job training	65%	60%	5%
Professional training and development	89%	85%	4%
Annual raises	82%	78%	4%
Comp time	48%	44%	4%
Challenge of work	94%	91%	3%
Large company	18%	15%	3%
Overall compensation	92%	90%	2%
Access to new technologies	91%	90%	1%
Recognition/appreciation of your work	77%	76%	1%
Job security	73%	73%	0%
Benefits package	89%	89%	0%
Opportunity to telecommute	40%	40%	0%
Small company	19%	20%	-1%
Workload	60%	61%	-1%
Likelihood of company going public	27%	28%	-1%
Leave (vacation, holidays, etc.)	72%	73%	-1%
Flexible work schedule	66%	67%	-1%
Autonomy	64%	66%	-2%
Stock options	49%	51%	-2%
Family friendliness	72%	75%	-3%
Proximity to home	59%	63%	-4%
Industry	31%	39%	-8%



Seekers: Actively looking for a new position

Explorers: Would follow up if they learned about an interesting job through an advertisement or another person.

Approachables: Would consider an opportunity only if they were personally contacted.

Loyalists: Cannot envision changing jobs in the foreseeable future.

It's the IT version of a second childhood – you get the goodies, we do the work. Interliant will host and manage your critical applications for you, over secure networks. We'll lower your costs, assure scalability and handle all upgrades. Plus do what most ASPs won't – take full responsibility. For more, 1-800-291-1053 or www.interliant.com/birthday

Interliant® We sell sanity.™

©2000 RedCreek Communications, Inc. RedCreek Communications, the RedCreek logo, and Ravlin are registered trademarks and ReD, PEN and the tagline are trademarks of RedCreek Communications, Inc.

could you delete him before he reaches the car?

ReD™ can. Which is great because half of all network security intrusions are within your firewall: corporate spies, negligence, and people like this guy, with outdated access.

RedCreek believes real security extends to users, not firewalls. Differentiating users requires Policy Enforced Networking (PEN™) management and that requires the new RedCreek e-Director (ReD). ReD makes PEN easy and ReD makes PEN work. ReD manages and enforces policy rules. Yes, it hides databases, email, and files in plain sight over the Internet, but it also hides them from user-to- user as well.

Yet, ReD has no network impact, requires no leased lines, is applicable: enterprise to teleworker, and, makes your files visible only to those with the correct policy.

Read all about the Ravlin® and ReD product lines at www.redcreek.com.

www.redcreek.com

Hide in Plain Sight™

RedCreek®

Continued from page 64

the subsidiary in Point Mugu, Calif., both locations virtually guarantee him a higher-than-normal paycheck.

Of course, you can find variations within regions. Sandee Sprang is the director of information resources at the South Carolina Office of the Attorney General in Columbia. Being in the South Atlantic region, Sprang's pay should be about 1.5% less than the norm. But being in the state's capital brings it in line with the higher-end regions, she says.

"I am extremely pleased with my salary and my budget," Sprang says. "They're at least as rewarding as those in the Northeast and on the West Coast."

In contrast, Eric Merillat, a network technician at Ferris State University in Big Rapids, Mich., says he knows he could double his salary if he commuted an hour south. Right now, making about $40,000, Merillat is content to stay at the university because of its tuition reimbursement program, and he prefers not to live in the city.

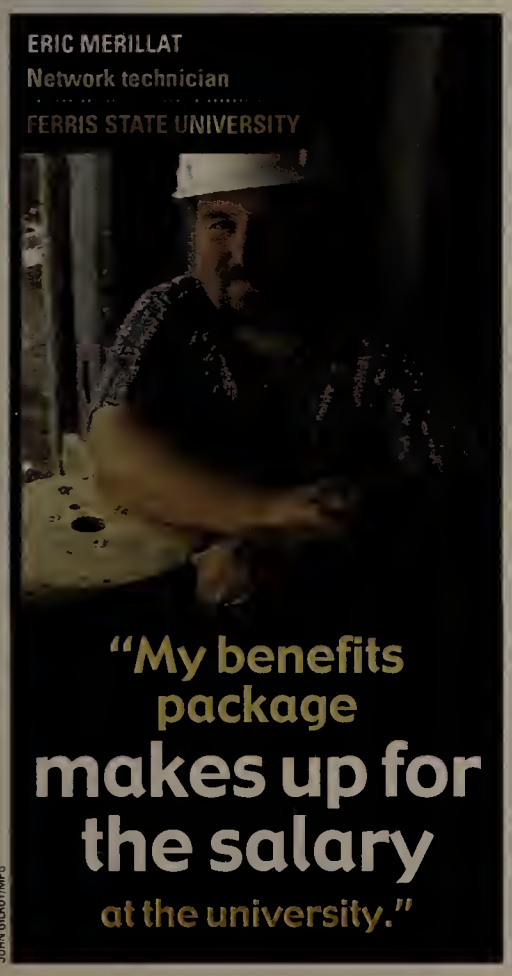
"My benefits package makes up for the salary," Merillat says.

Merillat also recognizes the budget constraints of a state university com-

See Salary, *page 71*

Type of organization

	Percent
Computer/IT manufacturing	4.2
Computer-related software or services	9.8
IT consulting	7.3
IT retail/wholesale	1.1
Manufacturing	13.6
Finance/banking	5.8
Insurance/real estate/ legal services	5.0
Health care services	5.2
Hospitality/entertainment/ recreation	.9
Media/TV/cable/radio/print	2.3
Retail/wholesale/trade/ business services	5.2
Transportation	1.3
Utilities	2.8
Education	11.6
Process industries	2.5
Government	11.0
Military	2.0
Nonprofit	1.4
Other	6.9



Don't be mystified by SAN solutions.

The choice is clear.

BROCADE

Combining award-winning Fibre Channel switches and SAN management software, BROCADE solutions provide scalability, centralized SAN fabric management, system interoperability, and high performance. BROCADE partners with major storage and systems OEMs and Integrators to provide SAN solutions optimized for LAN-free backup, storage and server consolidation, disaster tolerance, and high-availability applications. It's no wonder that BROCADE is the industry leader—and the clear choice—for SAN solutions.

Keep up to date with the latest news on SANs. Sign up for our complimentary *Common Threads* newsletter at www.brocade.com today.

©2000 by Brocade Communications Systems, Inc. All rights reserved. BROCADE and the BROCADE logo are registered trademarks of Brocade Communications Systems, Inc. in the United States and/or in other countries.

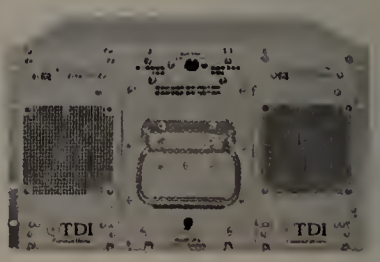
Power Systems that Won't Fail in Your Lifetime or His

The New "All-In-One" Power System

- No Single Point of Failure
- Dual AC Input + Battery Back-Up
- Seamless Input Power Transfer
- N + 1 Redundant
- Hot Bus Plug-In
- Modular, Self Contained

We can't even imagine what amazing things he'll see in his lifetime. But one thing he won't witness is a system failure due to an "All-In-One" power supply because input & output redundancy plus battery back-up have systematically eradicated every single point of failure. And we've included all this functionality in a system that is simple and easy to use.

The "All-In-One" is the world's most reliable power system.



Powering the Information Age

TDI
Transistor Devices

TDI - Transistor Devices
85 Horsehill Road, Cedar Knolls, NJ 07927
Phone: 973.267.1900 • Fax: 973.267.5232
www.tdipower.com

Continued from page 69

pared to a private company. "I will stay here and finish my degree, and then I'll see what I can make then," he says.

The man/woman thing

Roslyn Taylor, a network engineer for Sinclair Community College in Dayton, Ohio, agrees with Merillat that the public sector does not pay as well as a private company might. But she has the added disadvantage of being female.

Taylor describes a situation she encountered where a male employee with certification, but no experience, was hired at her salary. "He's a nice guy. But I am teaching him, and he is at the same pay grade," she says.

Taylor says she's not sure whether to attribute this apparent inequity to gender bias or to the value employers put on certification over experience.

When it comes to gender differences, in last year's survey, STAT Research detected a significant gap. Women were earning 72 cents for each dollar earned by men. This year, STAT did a more detailed analysis that compared men and women in similar job positions and also factored in the number of hours worked each week. It found that at the most senior positions, women actually earned more than men — $27.63 per hour compared to $25.95 per hour for senior IT managers. But when it comes to other jobs, such as IT staff or other IT management, men earn about $4 per hour more than women.

According to New Venture Gear's Brenamen, however, it's not all about the money. She's been with this Muncie, Ind., company for three years and manages a staff of 10. She took a full-time job with the company after a brief stint as a contractor because New Venture Gear "dangled a carrot I couldn't resist."

The carrot was a stable work environment with growth potential and great benefits.◪

DocFinder: 9023

More online

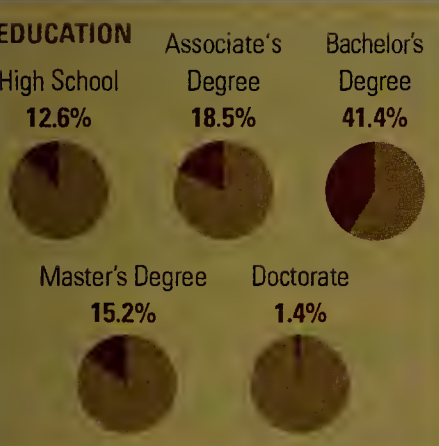
www.nwfusion.com/you2000

USE OUR SALARY CALCULATOR to figure out what you should be earning based on your job title, years of experience and location.

Education, certification levels of IT professionals

EDUCATION

High School	Associate's Degree	Bachelor's Degree	Master's Degree	Doctorate
12.6%	18.5%	41.4%	15.2%	1.4%



CERTIFICATION

Cisco Certified Network Assoc.	Novell Certified Network Admin.	Certified Novell Engineer	Microsoft Certified Pro.	Microsoft Certified Systems Engineer
6.7%	12.2%	10.3%	14.0%	12.4%

Internet Infrastructure for Service Providers.

Sometimes, the biggest problems can be solved with a simple solution.

Introducing 1System™ from Quad Research. The simple hardware solution for subscriber access, application/web serving, storage, and systems management. Because sometimes, less is more.

If you're an ASP, ISP, TSP or other service provider, putting together an Internet hardware platform to satisfy your subscribers can seem like a monstrous problem. But just because your problem is complex doesn't mean your solution has to be. The 1System seamlessly integrates all your hardware needs into a single 19-inch, rack-mounted modular format built to Telco-grade/NEBS specifications. It was designed specifically to meet the 100% uptime requirements of service providers. It delivers highly reliable carrier-class communications and switching, application and web serving, high-speed Fibre Channel storage, as well as integrated systems management and diagnostics. All available in a single box for entry-level configurations. Or for larger implementations, we provide a series of optically-connected, rack-mounted boxes, each performing a dedicated function. Your subscribers get unprecedented performance, and you get a simplified solution. So visit our web site or call 949.864.4000. And get that 500 pound gorilla off your back.

1System™ from QUAD RESEARCH™

www.quadresearch.com

Hardware Built for the Business of the Internet.™

©2000 Quad Research, 5 Whatney, Irvine, California 92618 USA • Phone 949.864.4000 • Fax 949.598.5959 • Quad Research and 1System are trademarks of Quad Research.

network management

We can dig you out.

We offer customized, single source solutions for all your data, Internet and network management needs. From monitoring, trouble shooting and performance trending to installation, management and design. Make your network more productive, and your business more profitable. Give us a call. And you can focus on more important things, like your business.

snet.com | 1-800-895-7400

SNET | SBC global network

Copyright ©2000 SBC Communications Inc. All rights reserved.

IF MY FRIENDS were to gossip about me, they'd say:

- Does she even listen to the stuff she says?
- In debt up to his teeth.
- He's a nice guy, but he doesn't have a clue.
- He's cheap and hates to spend money.
- He's full of useless facts.
- I hear he's being interviewed by Company X.

HOW OFTEN does a recruiter contact you on behalf of a vendor? (175 You survey respondents)

Should you heed a vendor's call?

By Paul Desmond

TALES OF NETWORK EXECUTIVES WHO HAVE LEAPT TO THE VENDOR RANKS.

TOM THOMAS
CEO, Scriptics

Left a high-profile CIO job to follow his dream of running a company

Tom Thomas paid his way through college in the 1960s by programming computers. With such initiative as his hallmark, he landed an IS job after graduation and rose steadily through the ranks, ultimately landing chief information officer spots at technology-savvy companies including Dell and 3Com.

By anyone's account, Thomas has had a successful IS career. Nonetheless, he abandoned that career track a few years back. A software vendor sought him out as CEO, and he answered the call.

Thomas is not unusual for following this path. Armed with first-hand knowledge of the environments vendors are trying to sell into, some network executives are landing jobs with vendors in marketing, sales and even in the executive suite. Others turn their ideas into products and services by starting their own companies.

Thomas' master plan took him from the grass roots of the data processing industry — complete with punch cards and magnetic tape — to high-profile CIO positions and finally to the corner office.

"As IT has evolved, I've evolved with it," he says. "Because my formal education was in business and commerce, I always had an eye toward how I could use technology to improve the business."

That pursuit served him well, whether working in IS in the health care industry in the late 1960s through the mid-1970s, as CIO for Kraft General Foods into the 1980s or as Dell CIO in the early 1990s.

Thomas' first taste of vendor life came with his move to 3Com, where his CIO title was topped off with that of senior vice president of the e-business unit. That job enabled him to run 3Com's internal IS organization as well as to shape its burgeoning commercial effort.

While at 3Com, Thomas joined the board of directors of Vantive, a customer relationship management software vendor. A few months later, Vantive's board pegged him as CEO. "It was a good opportunity for me to run a company as opposed to running large business units inside an enterprise," he says.

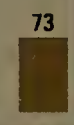
Thomas left that CEO spot when PeopleSoft acquired Vantive late last year. Not missing a beat, in February he joined Scriptics, a start-up business-to-business e-commerce software maker in Mountain View, Calif., as CEO.

Thomas argues that IT professionals

TOP 3 COMPANIES you most want to work for:
- Cisco
- NASA
- Your own

BUT SOME OF YOU dream of working for:
- Any company that makes more then $50 million with less than 200 employees
- A jet propulsion laboratory
- Martha Stewart
- Microsoft: "So I could convert it to NDS and NetWare."

AT WHAT TYPE of company do you work?
(265 You survey respondents)



- A dot com
- Traditional brick and mortar

are ideally positioned to learn about all facets of a company and, as such, are well-suited to take on larger leadership roles. He says if you compare a company to your hand, thinking of each finger as a different business unit or function, then your palm is the IT group, which touches all others. An IT executive has to be knowledgeable about each corporate function while being an expert in his own. "After you've been at it for a while, you develop a fairly deep level of understanding about how the business works," Thomas says.

A matter of contacts

Michael Surkan is another former IS professional who understands that dynamic and is now working for a vendor. In his case, the vendor is Contact Networks, a Redwood Shores, Calif., start-up that runs contact.com. This Web site offers an Internet-enabled address book.

Surkan got out of IS largely to escape job stress. As MIS manager for electronics manufacturer Flextronics International, he was often paged at 2 a.m. or interrupted during vacations to deal with work problems. "That was fine for a decade, but that was enough," he says.

Stress is part of his new job, too, but Surkan says the level doesn't compare to his IS days. "It's a whole different ball game from when a server fails and an 800-person assembly line shuts down," he says. "Nobody here is going to page me at 2 a.m. because a report didn't get done."

Besides being less stressful, his new position affords Surkan the opportunity to gain experience that he hopes will help him someday run a start-up of his own.

However, he cautions against expectations of quick riches from making the jump to the vendor side. While searching in January for the marketing position he now holds, Surkan was getting lots of IS job offers. "The truth is I was getting considerably better offers for IS positions, even with start-ups," he says.

A start-up born at the Pentagon

Another IS pro turned vendor is Amit Yoran, who caught the start-up bug while working at the Department of Defense. After three years there, he joined the Defense Information Systems Agency in 1996. He directed DISA's Computer Emergency Response Team, leading penetration testing of intelligence networks. At the time, DISA deployed the world's largest intrusion-detection infrastructure. "We were doing some leading work in how you correlate data across different sensors, look for and do trend analysis, and look for sophisticated attacks," he says.

That technology was one of Yoran's two main motivations for embarking on the start-up

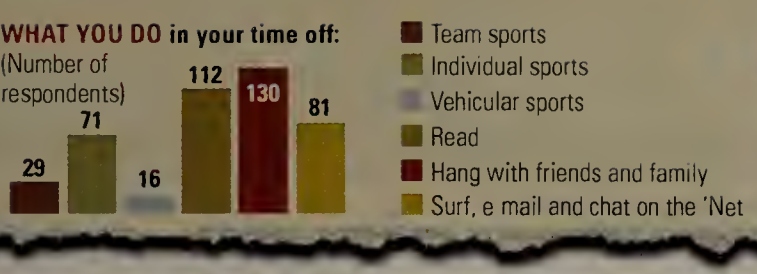
MICHAEL SURKAN
Product marketing manager, Contact Networks
Left his job as MIS manager to alleviate some stress in his life

© 2000 STEVE SKOLL

PC MAGAZINE EDITORS' CHOICE
April 4, 2000
Mammoth-2
Exabyte Corp.

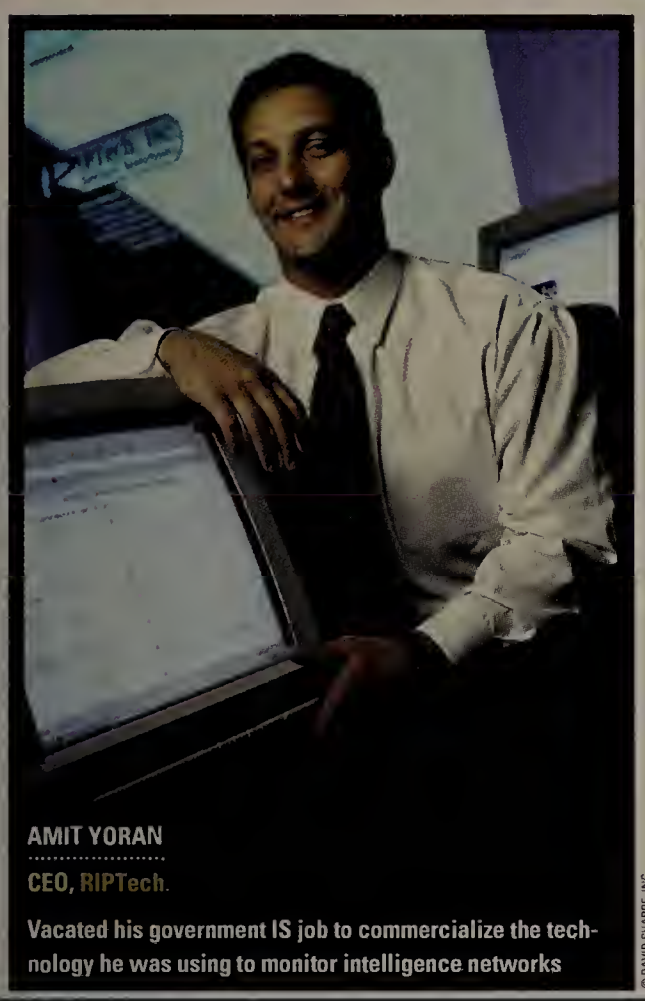
Exabyte's M2 is "problem-free and blazingly fast"

Exabyte M2™ Tape Libraries



YOUR UNUSUAL HOBBIES:

- Making books by hand
- Medieval re enactment
- Sell books and music at Native American powwows
- Collect and restore pinball machines
- Run an independent record label
- Taxidermy



AMIT YORAN

CEO, RIPTech.

Vacated his government IS job to commercialize the technology he was using to monitor intelligence networks

© DAVID SHARPE, INC.

route in 1998. His new company, RIPTech, of Alexandria, Va., is in the process of commercializing this technology — with Yoran as CEO. The company monitors security devices on your network, collects data and examines it for suspicious activity.

The second motivator was the attraction of working at a fast-paced small company rather than a slow-moving government agency, he says.

Yoran says that you need an outgoing personality to jump to a vendor. "On the technical side, while there needs to be customer focus, it's really you interacting with the technology more than anything else. At RIPTech, everything we do is customer-oriented. It's different," he says.

Know yourself

Scriptics' Thomas advises those thinking about the jump to consider what they get out of work. "The most rewarding job and the one I had the most fun at was CIO. You could see where your ideas and approaches were transforming a business," he says.

Desmond is vice president of King Content, a strategic publishing company in Framingham, Mass. He can be reached at paul_desmond@king-content.com.

Ready for the leap?

Know the answer to these three questions before making a move from IS to a vendor, advises Shaun Kelly, vice president of IT recruitment firm EDP Staffing Services in Newington, Conn.

- Why would you make the transition? You need to understand how, if at all, it will help your career.
- Do you have a plan for getting out of the career plan in case it flounders? You need to be able to explain why you attempted the transition.
- Are you staged financially to make the move? If you're a senior IS manager now, you can't expect to have the same earning power if you take an entry-level position with a vendor.

Dense, Rugged and Great In The Rack.

M2 tape libraries deliver the highest rack density in the industry, with rock-solid reliability. We've been engineering rack-mountable and stand-alone tape libraries for over a decade. With our award-winning M2 drives, our libraries deliver unrivaled performance, capacity and rack density.

Rack dense, rock solid. Guaranteed.

Take one for a 30-day trial. Visit m2wins.com for details.

Exabyte®
people working for you℠

1.800.EXABYTE m2wins.com

Exabyte is a registered trademark and M2 is a trademark of Exabyte Corporation. 150 GB capacity, 30 MBps assumes 2.5:1 compression. No purchase necessary. Some restrictions apply. Details available at www.m2wins.com. *PC Magazine* excerpts reprinted from *PC Magazine*, April 4, 2000, with permission. Copyright ©2000, Ziff Davis Media Inc. All rights reserved.

HERE HACKER, HACKER, HACKER.

Network ICE, the company that brought you BlackICE™, continues to pioneer enterprise-wide protection from hackers and malicious employees throughout today's borderless corporate network. Whether your notebooks, desktops and servers are remote, inside the firewall, or residing on a partner's extranet, Network ICE protects every system, everywhere, from a single manager.

Using revolutionary anti-hacker technology, Network ICE products act like an Internet bodyguard; inspecting every packet, blocking those that are hostile, allowing harmless data to pass, yet always ready to step in and intercept an attack. Even from someone you trust. Network ICE products complement existing firewalls and VPNs. Visit www.networkice.com to learn more about our enterprise solutions, and how to stop hackers cold...

Network I • C • E

www.networkice.com

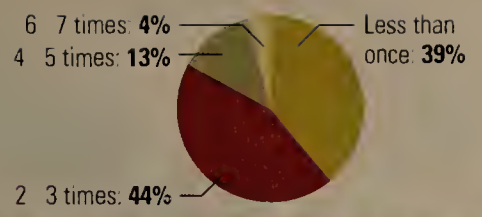
Stop Hackers Cold

©1998-2000 Network ICE Corporation. All rights reserved

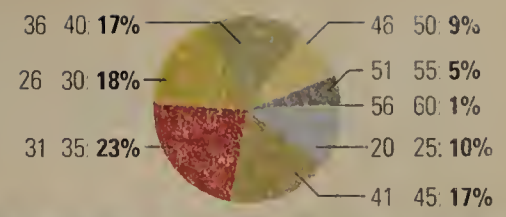
Your Job

HOW MANY NIGHTS PER WEEK do you eat out?

(522 You survey respondents)



YOUR AGE The average age of 175 You survey respondents is 36. Here's the breakdown:



PAUL R. KENNEDY/MPG

You work where?

OUR ANNUAL FORAY INTO THE UNUSUAL PLACES YOU DO YOUR JOBS

By Julie Bort and Beth Schultz

You all love networking — technically speaking — but the draw for some of you is greater than that. Here are the stories of network professionals who find inspiration in their unusual IT jobs.

To infinity and beyond!

With wobbly legs and a queasy stomach, you've just exited CyberSpace Mountain, the most exhilarating, terrifying roller coaster you've ever ridden. Never before have you careened around such death-defying twists, shot straight down so fast or rocketed around so many loops. And yet, there's not a physical track in sight.

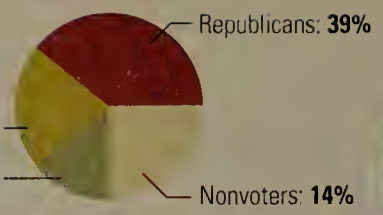
CyberSpace Mountain is the crème de la crème of immersive, virtual attractions at DisneyQuest Chicago, a 90,000-square-foot, five-story indoor theme park at a busy downtown corner. Software designers at Walt Disney Imagineering (WDI) created this extreme build-your-own coaster and other attractions, such as rides in which visitors dodge hungry dinosaurs as they raft down a prehistoric river or battle for buccaneer gold in the new Pirates of the Caribbean ride, pictured above.

While waiting for your nerves to settle, you marvel at this virtual tour de force. "How does Disney create such magic?" you wonder. "And how do I get a job here?"

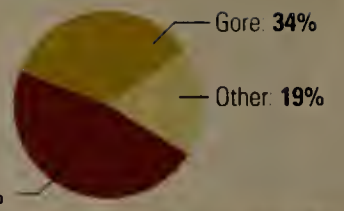
Expertise in running a remote-site retail operation was the starting point for Priscilla Carney, IS director at Disney Regional Entertainment (DRE), the Burbank, Calif., Disney unit running DisneyQuest. She became part of the magic about three years ago, when DRE hired her to implement the back-end systems and network infrastructure for its first indoor amusement park.

Carney's challenge has been just as difficult as the one Woody, of "Toy Story" fame, faced in convincing Buzz Lightyear that he was not a real spaceman but a toy. She joined DisneyQuest just six months prior to the opening of the prototypical DisneyQuest in Orlando.

YOUR POLITICS
122 You survey respondents said they are:



CASTING YOUR VOTES
Here's who 529 You survey respondents said they would vote for:



"I had three months to spec out and choose the systems, and three months to configure, install and test them," Carney says. "It's been an adventure."

Bumps along the way included changes in operational plans, discoveries during build-out and extra hours worked — all to do the right thing as opposed to the immediate and easy thing. "I don't think most IS people are ever exposed to the challenges that come with starting a business built around a new business concept," says Carney, who prides herself on her flexibility.

Most can't claim to support such snazzy applications, either. CyberSpace Mountain, for example, combines leading-edge, real-time computer image generation, 3-D virtual reality and sophisticated motion simulation. "The total integration and use of all the different technologies is just amazing," Carney says.

To ride CyberSpace Mountain, a guest creates his coaster at a workstation using a WDI-developed program. Once the coaster is designed, the file is transferred across a virtual LAN at 100M bit/sec to the workstation running the ride itself. The guest hops in a motion simulator, and the custom program controls the ride. The simulator is the type typically used by the aerospace industry, capable of 360-degree circles.

All attractions are networked as autonomous VLANs, which span multiple switches for load balancing and ease of maintenance. Likewise, a switch often supports more than one VLAN. If one switch fails, the attraction would not.

The network infrastructure is essentially the same at the three DisneyQuests, in Chicago, Orlando and Philadelphia. At each, Carney has installed approximately 15 VLANs and 10 Ethernet switches. She uses 100M bit/sec links for the bulky file transfers between create and play stations found in the Create Zone, one of four sections in the park. The other zones — Explore, Score and Replay — need only 10M bit/sec connections because those attractions don't require behind-the-scenes file transfers.

The switches are monitored remotely by the Disney network group in Orlando. If one switch issues an alert, a network technician will dial into it. If it can't be fixed remotely, an onsite IS analyst would be notified or a vendor technician dispatched, Carney says.

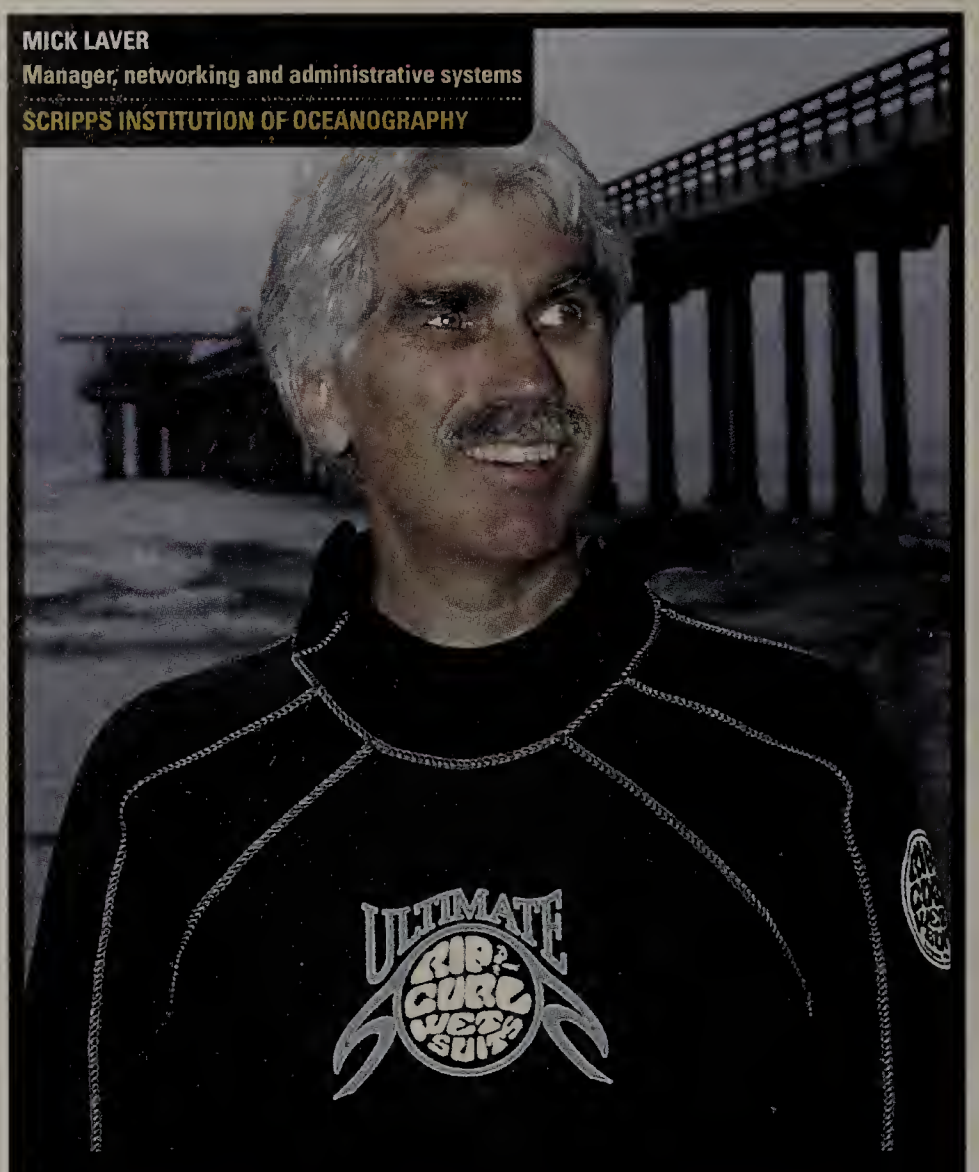
On the WAN side, Carney relies on Disney's frame relay network. She uses it primarily to transfer back-end data such as daily sales, e-mail and software upgrades for the back-office systems or attractions.

As cool a place as DisneyQuest is, it's obviously not all fun and games for the IT people. Even a tiny outage could make the magic disappear and disappoint guests. "We get guests that only come once a year, maybe even just once a lifetime. At each attraction, we only get them for 3 to 5 minutes, yet we've got to entertain them and make them feel like they've gotten their money's worth," says Joe Garlington, executive director for interactive show development at WDI.

From a network perspective, that means Carney relies on a "solid switch vendor" (that she won't name) with a proven track record and willingness to deal with her stringent specifications. "You won't find a more thorough scope of work document for installations," she says.

Scalability is a huge criterion, Carney says: "We need to be able to respond to future needs — DisneyQuest lives and breathes. Already, two attractions have been added and more are in development. The infrastructure needs to be in place to serve the unknown."

— Beth Schultz



Packets by the sea

The sea has always fascinated people. To us creatures of the land, the sea is a fierce enemy, an inviting playground, a haven for the mythological, a source of food, a thing of beauty, our worst fear. Above all, it is the keeper of the earth's deepest secrets.

From the shores of the Pacific Ocean in La Jolla, Calif., some 1,200 people labor to unlock its mysteries. At the Scripps Institution of Oceanography (SIO), a graduate school at University of California San Diego (UCSD) and a world-renowned research center, students study biology, chemistry, climatology, geophysics, geosciences and physics.

All of which generates boatloads of data.

The care and safety of that data is the responsibility of Mick Laver, manager of SIO's network and administrative systems. In a small, ocean-side metal building, where spare computer parts fight with boogie boards for floor space, Laver holds an enviable job. He lords over a state-of-the art network; gets virtually all the funds he needs for build-out because top management recognizes the network's importance; pioneers really cool projects; and surfs during his lunch hour.

"This sounds corny, but this is my dream job — second to being a rock star. As a boy, I knew I wanted to work at Scripps," says Laver, a tall man with a quick smile, dry wit and the relaxed, easygoing manner common to California beach folk. Rather than the customary sport coat and tie on a hanger in the office, behind Laver's chair hangs a wet suit.

Laver's been at SIO for more than two decades. The first half of his SIO career he was a deep-sea marine biologist, taking month-long turns at sea. "I've been down in Alvin, the sub that found the Titanic, about seven times. The deepest was 4,000 meters in the Panama basin," he says.

With the advent of microprocessors, Laver became fascinated by computing, returning to school for a masters in educational technology and then, in the late 1980s, taking a two-year stint as a microcomputer consultant for UCSD's computer center. As the network became the computer, Laver's job focused increasingly on SIO's network design.

Yet his experience as a researcher guides him to improve SIO's data infrastructure. For instance, a few months ago, he wired the SIO

See **Work where?**, *page 80*

Stranded by traditional delivery systems?

If you're in the business of distributing large amounts of data to multiple sites across wide distances, you need more than a traditional network — and more than just the Internet. You need a way to cost-effectively deliver **high bandwidth** information at the fastest speeds available nationwide. **What you need is DirecPC®.**

For just a few hundred dollars per site, you can equip your remote clients with a state-of-the-art satellite system, capable of receiving IP multicast content – or any other data – at up to **24 megabits per second.** Anytime, anywhere in the country. And it doesn't matter how many sites you have in your network. In fact, the more sites you add, the cheaper it usually gets. How many terrestrial networks can make that claim?

Call us at **877-253-2390** to find out how DirecPC can come to your rescue.

Find out how other businesses are putting DirecPC to work in financial data delivery, distance learning, software distribution, and dozens of other applications worldwide. Visit us at http://bizinfo.direcpc.com for more information.

HUGHES™
NETWORK SYSTEMS

© 2000, Hughes Network Systems. DirecPC® is a registered trademark of Hughes Network Systems, a Hughes Electronics Corporation company.
Your usage may be limited by the Fair Access Policy. For more information visit our Web site at www.direcpc.com.

YOUR FAVORITES

1. Bands: **Jimmy Buffet and Metallica**
2. Food: **Italian, specifically pizza and pasta**
3. General interest magazine: **Time**
4. Author: **Isaac Asimov**
5. Spectator sport: **Football**

HERE'S HOW SENIOR EXECUTIVES rated their concerns on a scale of 1 to 10:

Of most concern:

- Choosing between high pay and quality of life. 8.89
- Beefing up business skills. 8.78
- Staffing and training employees. 8.67

Continued from page 78

docking pier located at the Point Loma harbor with fiber and connected it to the SIO campus 16 miles away via a T-1 line. Now shipboard crews get the bandwidth they need, at least while their vessels are docked. To provide network connectivity at the pier, Laver ran fiber from a Cisco router in a nearby building through the machine shop (a warehouse-like building located near the pier) out to concrete structures on the pier called bunkers. These bunkers store connections to land-line phones, electricity and now, the network. An SIO ship that pulls up to shore can patch into the fiber and access applications, e-mail and the Web.

Ships collaborating with SIO can plug into a repeater with Cat-5 wiring, 10Base-T or fiber. This gives them access to the Web via the SIO network.

The SIO campus is equally challenging. Such close proximity to the sea means the innards of computing equipment can quickly corrode. The network team stocks up on cheap parts and replaces them often.

Likewise, the institution is forever tearing down or renovating old buildings and erecting new ones. This year, the SIO has doubled its annual budget to $400,000 to accommodate network upgrades. Since 1992, the entire physical infrastructure has been overhauled, with archaic overhead wire ripped out and fiber run underground to all 80 buildings on the sprawling campus. With that, Laver moved the network to an ATM core.

Today, the heart of the network is a Cisco Catalyst 5500 with a route-switch module. From the 5500, an OC-3 ATM link connects SIO to UCSD's main campus, about a mile away. Another ATM link, this one OC-12, connects the 5500 directly to the San Diego supercomputer center, also located at the UCSD campus, and from the supercomputer center to the Internet.

On the SIO campus, the network supports 10 research groups, plus the Stephen Birch Aquarium Museum and the U.S. Marine Life Fisheries Service. It also supports the Institution of Geophysics and Planetary Physics (IGPP), a University of California-wide research group based at SIO. IGPP owns a supercomputer at the San Diego supercomputer center, and Laver's wires are tapped to transport big-time calculations it's running.

Because research groups are divided among buildings, many buildings have their own switches, all of which link to the main 5500. For these buildings, SIO uses 10 Catalyst 5500-family switches and about 12 Catalyst 2900- or 2800-family edge switches. Bandwidth will never be a constraint, Laver vows.

Every building 5500 connects to the main 5500 via an OC-3 ATM uplink, with one exception: IGPP's 5500s are connected via Gigabit Ethernet. The edge switches in the smaller buildings are connected via OC-3 ATM or Fast Ethernet. The 5500s in the buildings also sport 10/100 Ethernet desktop connections. In all, this network supports more than 1,500 desktops, divided in thirds among various Unix, Windows and MacOS flavors.

"The Internet changes everything. I now estimate what I'll need and then double it. More copper, more fiber, higher-density switches," Laver says.

The technical aptitude of his users, coupled with the script-kiddy culture of university life, makes security his biggest worry. Many researchers and technical users are apt to slap a Linux, Solaris or Windows NT box up, not realizing that any security gaffs they've made could put the entire network at risk.

"These guys don't have the time, interest or expertise to be system administrators," Laver says. "Security is the area that suffers most."

But if the people of Scripps cause him his biggest technical headache, they are also the reason Laver stays put. SIO is recognized as its own village within the UC system, whose citizens throw Friday night beer bashes and are among the brightest scientists in the world. "We are a very close-knit group," Laver says.

— Julie Bort

A life-and-death job

Tragedy strikes during a weekend outing, and suddenly one family in Washington is dealing with death. Turning this misfortune into goodness, the parents decide to donate their child's organs. With this act, they offer life to a few desperately ill souls.

Because it's possible to transplant as many as eight organs from a single donor, organs from the child's body are distributed to transplant patients across the country. The kidneys, which can survive the longest outside the body, are the last organs to be matched. The left kidney goes to a woman in Texas and the right kidney to someone in New Jersey.

Being a vital link in this circle of life keeps Berkeley Keck enthralled with the job he's held for nine years. Keck is IT director for the United Network of Organ Sharing (UNOS), a private nonprofit scientific and educational organization in Richmond, Va.

"The nature of this work is just so interesting," says the soft-spoken but tough Keck.

For nearly 15 years, UNOS has carried the weighty responsibility of quick and equitable organ distribution. It has been overseeing the U.S. Department of Health and Human Services' Organ Procurement and Transplantation Network (OPTN) since 1986. OPTN is the national transplant system through which organ matches are made. The following year, it added responsibility for the U.S. Scientific Registry of Transplant Recipients, which is a database of all organ transplants.

Keck boasts that UNOS' ability to gather and analyze organ-related data has recently become a lot easier. Last October, UNOS launched an extranet, called UNet. It is the crowning glory of a network migration Keck has lorded over since he came to UNOS nearly a decade ago. Slowly but steadily, project after project, the ever-persistent IT director moved UNOS out of the minicomputer and into the Internet era — and closer toward his vision of an open, reliable and infinitely more user-friendly system.

UNet replaces an outmoded, non-Y2K-compliant minicomputer/dumb terminal setup that people accessed via sometimes-flaky dial-up X.25 links. For the Registry, a Web application replaces Lotus Notes replication. Printed and faxed forms were the default, making it difficult to provide more than the minimum information required.

Now, any of the 5,000 UNOS members can

See **Work where?**, *page 82*

Unbeatable.

Tired of second-rate products and services? Choose a BLACK BOX® ServSwitch™ and start saving with the best KVM switch on the market. We have the **broadest** product line, and we back it up with the most comprehensive support services in the industry. Other companies simply can't offer the same free consultations, expert 24-hour tech support, and unbeatable warranties. At Black Box, they're part of the package.

Don't settle for second best when you can have ServSwitch.

Expect more. Save more. Choose BLACK BOX.

BLACK BOX®
NETWORK SERVICES
724-746-5500
www.blackbox.com

Continued from page 80

access organ transplant information over the Internet with a PC and browser. For example, transplant surgeons can access UNet from home, even late at night. The site is password-protected at various levels so users can only get the information they need to do their jobs.

For OPTN, UNet makes it much easier for users to enter data, so they provide more information than ever before. In turn, policy-makers can use that information to better determine organ placement processes.

UNet also lets users initiate match runs with a click. Processing time varies by organ type, but a recipient list for intestines can be generated in as little as 13 seconds. A kidney match, the longest that can be run, takes 5 minutes at most, Keck says.

The Microsoft SQL Server 7.0 database used for the match information runs on two clustered Digital 7310 servers that have quad 600-MHz Alpha processors. Ease of data entry already has boosted the database to four times the size it started at in October, says Joe Wysowski, assistant director of systems technology at UNOS, and one of Keck's right-hand men. Data storage has quickly grown to 80G bytes, he says.

UNet Web applications reside on a cluster of three load-balanced Compaq 5500 servers with dual 400-MHz Pentium II Xeon processors running Microsoft's Internet Information Server 4.0 and Windows 2000.

In all, UNOS uses 41 servers for external and internal operations, ranging from Alphas to desktop machines. They're networked on a 100M bit/sec Ethernet LAN.

Everything on the network, including T-1 Internet connections, is fully redundant and locked down. Keck says he's even commissioned a new local exchange carrier, Cavalier Telephone, to bring a SONET ring into UNOS headquarters so he could eliminate the single point of failure that existed on the net.

Member reaction to UNet has made the arduous two-year project worth every effort, Keck says with pride. "Users keep calling and saying how much faster and more efficient this is than the old system. That's what this job is all about for us," he says, beaming.

The payoff is tangible. All one has to do is stroll the UNOS hallways to witness it firsthand. Framed pictures of organ recipients and thank-you letters line the walls of this otherwise nondescript office suite.

Keck says one of his favorites is a long, narrow print of babies who have received new hearts at one transplant center.

Of course, Keck didn't bring UNOS onto the Web on his own. Counting programmers, systems engineers, help desk technicians, training specialists and organ center staffers, he oversees roughly 95 people. Keck says UNet has kept his folks challenged and happy: "UNOS' mission makes people feel like they're doing some good."

Keck says he feels that way himself. Doing good is what keeps him smiling at policy-makers and squeezing vendors to give him more for less.

As gratifying as the job may be, it does carry a grim reality. The number of potential recipients is staggering — as of late April, more than 69,000 patients were waiting for new organs nationally.

With life hanging in the balance, Keck and his team vow with tenacity to provide a glitch-free operation. "We absolutely can't have downtime. If we can't run matches, people don't get organs," Keck says.

— Beth Schultz

FireProof™ firewall load balancers from RADWARE can increase access without sacrificing security.

Don't get burned by your firewall. Protect your investment with FireProof, the red-hot firewall load balancing solution from RADWARE. No smoke, no mirrors, just red-hot performance. Throw in automatic failover, redundancy and continuous health checking and you have a FireProof solution. FireProof lets you turn up the heat with confidence —the hotter the better. FireProof can handle the hottest networks delivering consistent availability and performance. Increase your firepower while insulating yourself from network meltdown. FireProof—blazing performance. Unmatched protection.

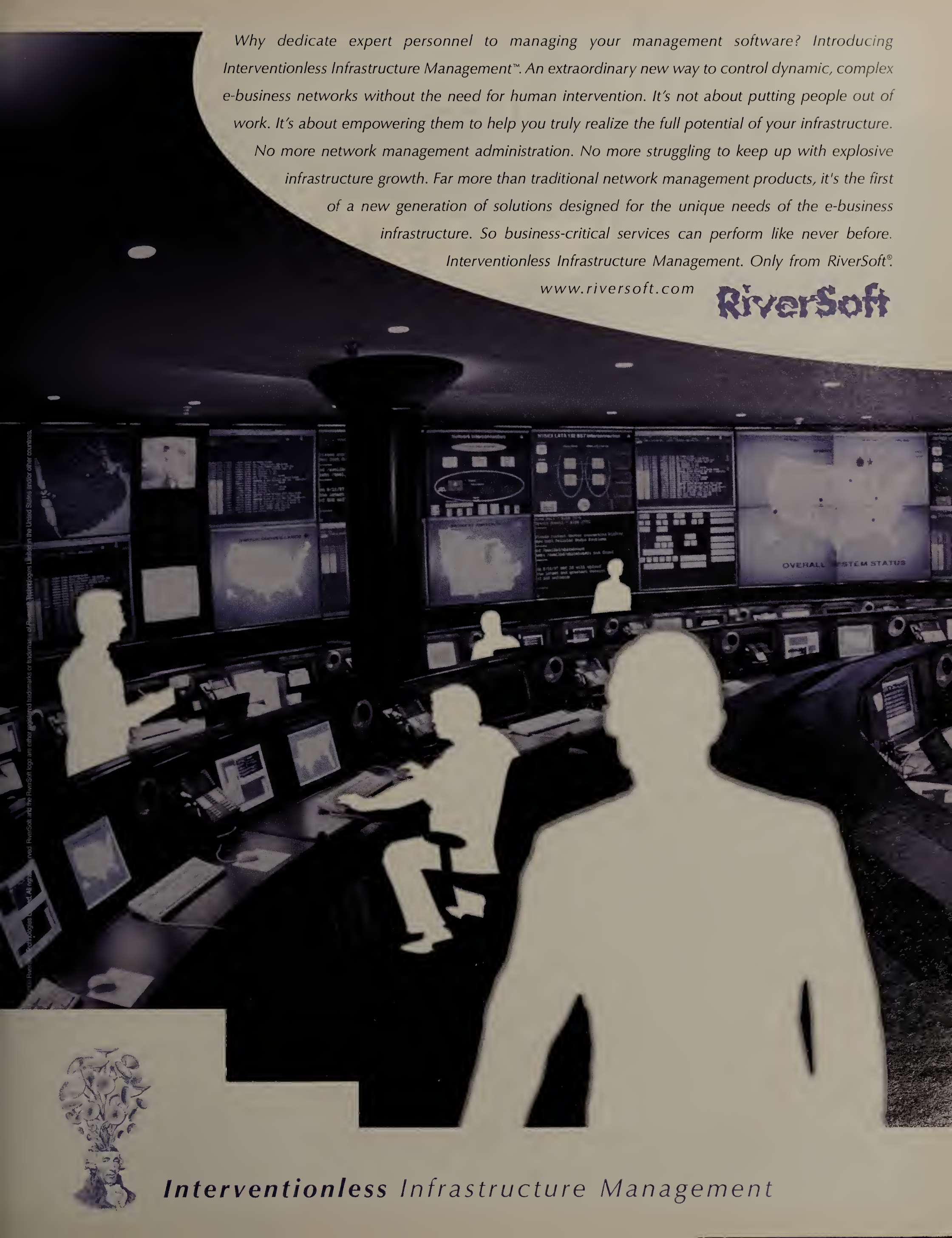
Check Point OPSEC CERTIFIED

internet WORLD BEST OF SHOW

U.S.A. Offices: RADWARE Inc. Toll free: 1-888-234-5763 e-mail: info@radware.com
International Headquarters: RADWARE Ltd. e-mail: info@radware.co.il
http://www.radware.com

Always On-Line

RAD WARE


Why dedicate expert personnel to managing your management software? Introducing Interventionless Infrastructure Management™. An extraordinary new way to control dynamic, complex e-business networks without the need for human intervention. It's not about putting people out of work. It's about empowering them to help you truly realize the full potential of your infrastructure. No more network management administration. No more struggling to keep up with explosive infrastructure growth. Far more than traditional network management products, it's the first of a new generation of solutions designed for the unique needs of the e-business infrastructure. So business-critical services can perform like never before. Interventionless Infrastructure Management. Only from RiverSoft®.
www.riversoft.com
RiverSoft
Interventionless Infrastructure Management

"More robust and faster than its competitors..."

ENT Magazine

"Ridiculously easy to use..."

SC Info Security Magazine

"Best blend of features and security..."

Computer Reseller News, Editors' Choice

PC EXPERT Editors Choice July 1999

TEST CENTER 1999 Reseller News EDITORS' CHOICE

SC SECURITY MAGAZINE OVERALL RATING ★★★★★

Remote Control Software

Tell pcAnywhere to go fly a kite.

	% of standalone
NetOp	
pcAnywhere	
LapLink	

Reported by *Computer Reseller News*, May 24, 1999

Improved Security • New Features • W2K Integration • New Support Features

NEW version 6.5

NetOp Remote Control is the award-winning solution taking enterprise management and support desk initiatives to new heights. NetOp is so fast and easy to use you will feel like you are sitting right in front of the distant PC. NetOp's advanced security, request help options, type-and-talk communication, and crash recovery make supporting your network and users a breeze.

NetOp enables you to access remote PCs and servers via the Internet, modem or networks and works on every PC in your organization: Windows NT, Windows 98/95/3.1X, DOS and even OS/2.

So, if you have problems getting pcAnywhere, LapLink or any of those bundled remote products off the ground, go to **www.CrossTecCorp.com** or call 1-800-675-0729 and take NetOp for a free test flight today.

NetOp®

Download your FREE fully-functional evaluation copy at www.CrossTecCorp.com

NetOp and the red kite are registered trademarks of Danware Data A/S. Other brand and product names are trademarks of their respective holders. 2000 Copyright Danware Data A/S. All rights reserved.

800-675-0729

CrossTec Corporation

Your Job

HERE'S HOW NETWORK EXECUTIVES/MANAGERS rated their concerns on a scale of 1 to 10:

Of most concern:
- Staying staffed. 8.35
- Training of self and staff in emerging technologies. 8.14
- Choosing between high pay and quality of life. 8.05

Of least concern:
- ASP services. 3.75
- Managing outsourcers. 3.06
- Finding outsourcers. 3.61

Your personal challenges

IN IT, A DISABILITY IS NO LIABILITY.

By Suzanne Gaspar

Rodney Wines sees his role in networking clearly. He's the senior systems administrator for Alcatel's corporate headquarters in Paris. A 30-year veteran of the computing industry, today he installs TCP wrappers, as well as DNS, SMTP, proxy and Web servers; manages network backups, writes scripts and more.

Yet Wines is legally blind. Wearing glasses, he has enough farsighted vision to get around but can't see detail. He relies on heavy magnification for that.

"To read the smallest print, my nose must be almost touching whatever I'm reading in order to focus properly. I can't learn by looking over someone's shoulder. In order to see the screen, I'd need to get so close that we'd better be good friends," laughs Wines, an amiable man who is living proof that physical impairments are not necessarily limitations for IT folks.

This conclusion is dawning on an increasing numbers of companies. Many more are now accommodating people who have disabilities. As of 1998, the most recent year for which statistics are available, out of a total of 120 million people employed, 16 million were disabled. Of these, 250,000 were employed as computer equipment operators, computer scientists and programmers, according to a report from the National Institute on Disability and Rehabilitative Research.

People who have disabilities will be increasingly tapped to fill the labor shortage. The Department of Labor projects that, by the year 2006, there will be 25 million more jobs than workers. Already, a good 10 million unfilled IT jobs languish in the U.S. Yet, as of 1998, 12 million people who had disabilities were looking for work, according to a poll conducted that year by Harris and Associates, a market research firm in New York.

What companies are learning is something that Wines himself helped to teach: In some ways, a so-called disability is more like a benefit in the IT world. For instance, because he sees poorly, Wines has developed better work habits. He relies more on actual knowledge and less on visual cues than his colleagues do.

"A typical person uses the instruction manual as a surface for a coffee or beer while the hardware gets put together, consulting it only as a troubleshooting guide if the finished product doesn't work. I can't afford to do this — and that doesn't mean I drink any less coffee or beer," he quips.

Rather, he reads a manual cover to cover even before unpacking the hardware. This lets him know what to look for, especially with items that are intrinsically hard to see, such as labels on connectors and sockets. With the manual memorized, he knows that the "video-out" connector is third from the left before he touches the device. In the long run, he ends up knowing the hardware better than someone who waits for it to break and then reads up on it.

With less reliance on eyesight, he's also developed better organizational skills than many of his peers. For example, he writes his technical notes while he develops his code. "I line up comments for readability and indent the code to show the program structure. When I type an opening bracket, I immediately type the corresponding closing bracket, then add the code in the middle," he describes.

Early in his career, in the late '60s, Wines says his disability made it difficult for him to convince people he could do the job. He found himself battling with prospective employers' perceptions. During an interview at IBM Research and Development labs, "A very nervous human resources guy told me I'd need to wear safety glasses while in the lab so I wouldn't break my glasses when I ran into things," Wines says.

While Wines didn't get that position, he did eventually accept a different IBM job. He says the company has grown into a notable employer of people with disabilities.

In fact, helping to break people of their wariness has become one of Wines' proudest achievements. Such was the case at ITT, which has since been acquired by Alcatel. After he'd worked several years at ITT, the company was considering hiring another person with low vision. "I happened to overhear a couple of managers discussing the situation in the hall. One manager told the other, 'Wines does the job, and he doesn't see well.' Later, when ITT hired its third low-vision person, they just asked the new guy what special equipment he'd need," Wines says.

Still, his biggest objection is that labels like "physically challenged" are barriers to understanding.

Other network professionals with disabilities agree. "A good working environment has a level playing field. People don't care about what you can't do, but only what you can do," says Ralph Carlson, a technical staffer at Lucent, in Lisle, Ill., and president of the company's Individuals with Disabilities: Enabling Advocacy Link (IDEAL) program. IDEAL helps integrate disabled IT workers into Lucent's mainstream.

Like Wines, Carlson is a network professional with a disability. He has worked for more than 16 years at Lucent, where he administers the intranet and Informix database.

Diagnosed in 1978 with multiple sclerosis, he began using a cane in 1984 and steadily lost the use of his legs. Aside from an ergonomic keyboard, the only adaptive device Carlson needs at the office is an electric scooter. For travel, he requires wheelchair accessibility and orders a full-size rental vehicle equipped with hand controls for a gas pedal and a left-side steering column brake.

Because of his illness, Carlson breaks up his workday with rest periods. As his symptoms progressed, his supervisors worked with him to modify his schedule. They also set up a home office, which lets him skip the commute a few days a week. "They asked me if that would work for me, not the other way around," Carlson says.

In 1987, Carlson joined the company's Affirmative Action Council and noticed it had no programs for people with disabilities. With management's support, he began a local group, Awareness of Inconvenienced Members of Society (AIMS). In 1989, AIMS merged with the corporatewide IDEAL group.

Over time, IDEAL has worked with management to provide awareness and sensitivity training, resolve accessibility issues and consult on new construction projects. With the passage of

See **Disability,** *page 88*

The YOU Issue

EXECUTIVE PROFILES

A Special Advertising Section

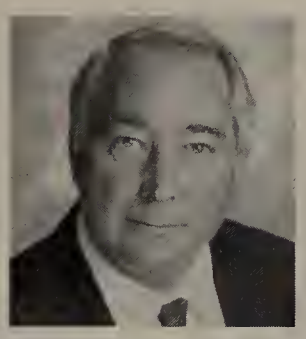
Greg Reyes
President and CEO
Brocade Communications, Inc.
(408) 487-8000
www.brocade.com

BROCADE is the market leader in Fibre Channel fabric solutions that provide the intelligent backbone for Storage Area Networks (SANs). The BROCADE SilkWorm® family of Fibre Channel switches and software provide a scaleable, high-speed interconnect between server systems and attached storage devices, and are designed to enable continuous availability of data in the storage enterprise. Using BROCADE solutions, companies can simplify the implementation of SANs, reduce the total cost of ownership of data storage environments, and improve network and application efficiency and performance.

CUBIX

Jim Zakzeski
Vice President of Marketing and Sales
Cubix Corporation
(775) 888-1000
www.cubix.com

Dot.coms, ISPs, ASPs, web-hosting providers, telephony, test labs, and corporations all use Cubix's multi-server systems to save space, reduce costs, and create world-class data centers. Cubix systems can host up to 8 individual servers in a 7U chassis and feature integrated K/V/M switching, fault-tolerant architecture and optional remote hardware management.



Stephen Thornton
President, CEO & Chairman
Cybex Computer Products Corporation
(800) 932-9239
www.cybex.com

Cybex Computer Products Corporation (NASDAQ:CBXC) is the world's premier provider of KVM switching, extension and remote access solutions for enterprise data centers who need to manage hundreds of servers. The XP4000 Series is today's most advanced and versatile multi-user, multi-form switching solution for contemporary server room management. Combined with KeyView II, administrators can remotely control any server, anywhere in the world. This remote access hardware system provides users with control of any server from CMOS settings to power cycling servers.

Kelly Beavers
President and COO
Ecrix Corporation
(303) 402-9626 or (800) VXA-TAPE
www.ecrix.com

Ecrix's mission is to provide data storage tape products offering unprecedented data capacity, performance and value for midrange servers and high-end workstations. VXA®, the first tape technology innovation in over a decade, virtually guarantees 100% data restore — an unmatched differentiation from competing products. Spectacular industry reception has garnered 10 distinguished product awards.

Khoa Nguyen
Chairman and CEO
Ezenia! Inc.
(781) 229-2000
www.ezenia.com

Ezenia! Inc. brings life to the network. As the global leader in multimedia group communications with thousands of servers installed in corporations worldwide, Ezenia! allows groups to interact regardless of their location enabling dispersed teams to work together effectively and allowing vital information to be disseminated quickly.

Bobby Johnson
President & CEO
Foundry Networks, Inc.
(888) 887-2652
www.foundrynetworks.com

Foundry Networks, Inc., is a leader in high-performance end-to-end switching and routing solutions including Internet Routers, Layer 2/3 LAN Switches, and Layer 4-7 Traffic Management Switching systems. Foundry's 2000+ customers include the world's premier ISPs, portals, e-commerce sites, and universities along with the leading entertainment, pharmaceutical, financial, and manufacturing companies.

All efforts have been made to make this listing as complete and accurate as possible. *Network World* is not liable for errors or omissions.

Continued from page 86

the Americans with Disabilities Act in 1990, Carlson says he noticed a greater openness and willingness to talk about disabilities and accommodations within his company.

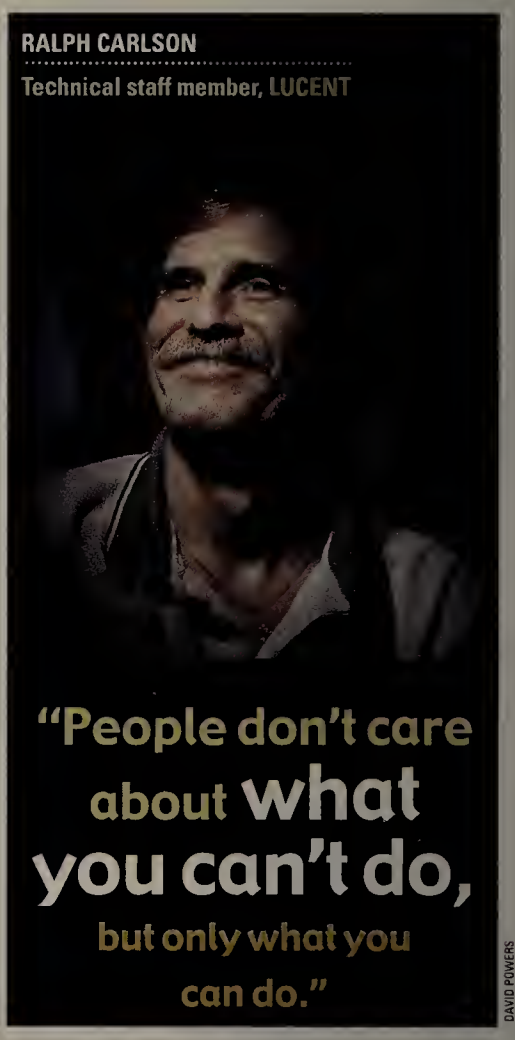
Wines' and Carlson's stories are becoming less unique in IT.

Training employers on disability-sensitive issues has been on the rise, says Jeff Schaffer, a principal at Booz, Allen & Hamilton. Schaffer knows firsthand. He has been largely wheelchair-bound for three years, following a car accident that left him unable to walk except for short distances and in excruciating pain.

Schaffer's personal experience led him to bring his 17 years of management consulting expertise to the field of disability consulting. He now leads Booz Allen's Disabilities Task Force, an employee group.

"I became an advocate for individuals with disabilities and formed a task force to improve employment opportunities within my company," Schaffer says. Then he took his message to the road. His Disabilities Forum has worked with the President's Committee on Employment of People With Disabilities, the National Business and Disability Council and Microsoft's Able To Work program.

During his recovery at various hospitals, Schaffer was struck by the number of disabled people who had withdrawn inside themselves. He understands, as he too had moments when he was tempted to retreat.



"I realized that by taking very little time off from work and maintaining a normal routine, I could fight off depression and lessen the impact of my health problems," Schaffer says.

Most of all, he discovered the Internet made his recovery and adjustment to a less mobile lifestyle easier. "By being a member of the e-generation, one can escape the bounds of a damaged body and compete on equal terms with those without disabilities," Schaffer says.

Using the Internet, Schaffer, like everyone else, can communicate with colleagues, participate in meetings and complete other work. It was also the instrument he used "...to research assistive technologies that have allowed me to overcome my disabilities."

Wines perhaps sums up the new-and-improved workplace attitude best: "Different doesn't always mean harder or worse or better. I am held to the same performance standards as [my] colleagues, but we may arrive at the end product by different paths." ◪

VXA

IT'S ALL ABOUT RESTORE

66 GB
6 MB/sec
$899*

Say Hello to a Good Buy.

The VXA-1 TAPE DRIVE offers you 3 times the performance and capacity of DDS-3 at about the same cost, and higher performance and capacity than DDS-4 at less cost. Plus, it provides sky-high reliability, unheard of restore capabilities, and compatibility with just about every operating system and software out there. That's what happens when two engineers, who have been pioneering tape drive innovations for a combined 60 years, set out once again to create something just a little bit better. A little bit smarter. And a lot more affordable.

Try it for yourself, free, for a full 30 days. Just go to **www.ecrix.com/nw**. Or call **800.VXA.TAPE**—and say hello.

*MSRP for internal drive. External drive pictured, $1,049 MSRP. Specifications assume a 2:1 ALDC hardware compression ratio.
© Copyright Ecrix Corporation 2000. All rights reserved. VXA is a registered trademark of Ecrix Corporation.

Tech Data

TAPE DRIVES BY Ecrix

The YOU Issue

EXECUTIVE PROFILES

A Special Advertising Section

Marc H. Bell
Chairman and CEO
Globix Corporation
(800) 4-GLOBIX
www.globix.com

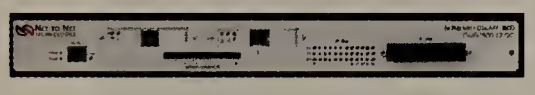
Globix Corporation is a leading provider of advanced Internet services and connectivity for businesses in the United States and Europe. Through its high-speed, high-availability, fiber-optic network and state-of-the-art Internet Data Centers in New York City, Santa Clara, CA, and London, UK, Globix delivers superior reliability, security and performance to companies using the Internet to deploy mission-critical business strategies. Cutting-edge solutions include Co-Location, Hosting and Dedicated Access. The Application Services group at Globix offers services such as Streaming Media, Electronic Commerce, Solutions Architecture and Internet Security.

Herb Hribar
President and CEO
Interliant, Inc.
(914) 640-9000
www.interliant.com

Interliant is a leading global application service provider (ASP) offering end-to-end, packaged solutions including messaging and knowledge management, security, e-commerce, CRM, ERP, distributed learning and Web site hosting. Interliant's partners include industry leaders such as Microsoft, IBM, Dell, Lotus, Network Solutions, AOL and Onyx.

Glen H. Lowry
President/Chairman
Linux NetworX
(801) 562-1010
www.linuxnetworx.com or www.lnxi.com

Mr. Lowry's experience with cutting edge technology spans over two decades. He began building his technical expertise at Hewlett-Packard where he worked at corporate headquarters, the Boise Division and the Neely Sales Region. He was employed in research and development and held various other positions. Mr. Lowry also co-founded Micron Technology and worked as general manager, consultant and treasurer. Later, at Computer Systems Architects, he was employed as the director of sales and marketing. Currently, Mr. Lowry is the president and chairman of Linux NetworX.



Net to Net Technologies, Inc.
(877) 638-2638
www.nettonettech.com

Net to Net Technologies' G.lite Access Multiplexer — available for use with the company's native IP DSLAMs, or as a standalone "Mini DSLAM" — provides a cost-effective, easy to use solution for carriers and service providers wishing to penetrate the residential market. Net to Net is the pioneer of native IP technology to provide "DSL the Easy Way."

Greg Gilliom
CEO
Network ICE
(650) 532-4100
www.networkice.com

Network ICE pioneered enterprise-wide protection from hackers and malicious employees throughout today's borderless corporate networks using a single web-based console. Network ICE products protect local and remote notebooks, desktops, and servers from attack by detecting and identifying intruders, and locking them out.

NETWORK® INSTRUMENTS

Network Instruments
(952) 932-9899
www.networkinstruments.com

July 2000 marks the release of Network Instruments' Expert Observer®, a high-performance, full-featured protocol analyzer and real-time expert system. Expert Observer is a complete troubleshooting tool that includes the facility to easily and automatically identify and help to solve network problems for both entry-level and experienced network administrators.

All efforts have been made to make this listing as complete and accurate as possible. *Network World* is not liable for errors or omissions.

The YOU Issue

EXECUTIVE PROFILES

A Special Advertising Section

T. Kent Elliott
Sr. Vice President & General Manager
Nokia Internet Communications
(877) 997-9199
www.nokia.com

Nokia Internet Communications, based in Mountain View, CA, is committed to assuring the security and reliability of e-business and mobile Internet transactions. Focusing on the bottleneck at the service integration point between the content and the infrastructure, Nokia takes a leading role with enterprises and managed service providers in providing reliable, secure, and scalable network components. Nokia Internet Communications is committed to addressing the service integration point in four critical areas of network protection, network extension, network transparency, and network acceleration.

Eric J. Ruff
CEO
PowerQuest® Corporation
(801) 437-8900 or (800) 379-2566
www.powerquest.com

PowerQuest Corp., a leading software developer and technology pioneer, provides proven solutions for storage management. Based in Orem, Utah, PowerQuest was founded in 1993 and launched its premier product, PartitionMagic®, in 1995. PowerQuest solutions help IS professionals manage, deploy and protect their storage devices in an enterprise. Other products include Drive Image® Pro, ServerMagic®, PowerQuest DataKeeper™, DriveCopy and SecondChance™.

Mike Pagani
VP of Marketing
QUAD Research
(949) 864-4000
www.quadresearch.com

QUAD Research manufactures the 1System™ award winning, patent pending Internet infrastructure hardware platform. The 1System is engineered to NEBS/Telco grade specifications and is designed to meet the 100% uptime and ultra high speed processing requirements of Service Providers. QUAD Research is an executive level member of the ASP Industry Consortium.

Doron Meirom
President
RADWARE, Inc.
(888) 234-5763
www.radware.com

RADWARE believes the e-relationship between content provider and user is the vital link to success in the networked world. To thrive in this world, companies must deploy and maintain an infrastructure which is fast, redundant, scalable and available 7x24. RADWARE provides the intelligent solutions that bring certainty to dynamic networks, thereby ensuring the best service from click to content.

Steve Peters
Executive Vice President
RedCreek Communications, Inc.
(510) 745-3900
www.redcreek.com

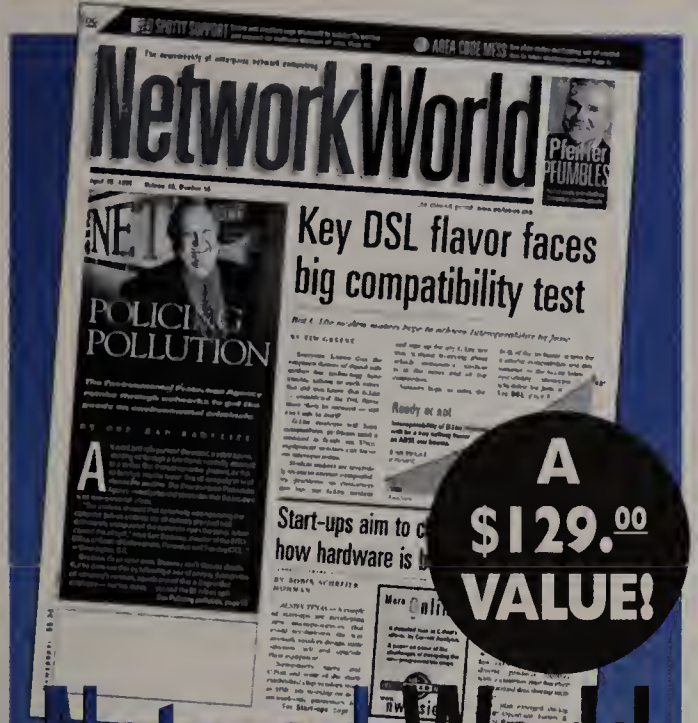
RedCreek makes IPSec appliances that make everything from personal records to strategic advantages invisible in the most public of public networks. More important, RedCreek products are just as invisible to network administrators, high bandwidth applications, and internal corporate spies. While almost as invisible to your CFO. RedCreek solutions ensure secure transmission of data — confidently — from the largest enterprise to the individual teleworker. RedCreek. Hide in Plain Sight™.

Dominic Gattuso
President and CEO
RiverSoft
(415) 438-2356
www.riversoft.com

RiverSoft, the interventionless infrastructure management company, helps organizations keep pace with the explosive growth and dynamic nature of e-business-driven networks. By automatically maintaining an in-depth view of network connectivity, RiverSoft provides accurate root cause analysis of network faults and dramatically reduces the cost of maintaining e-business infrastructures.

All efforts have been made to make this listing as complete and accurate as possible. *Network World* is not liable for errors or omissions.

7/00—KW/CP—00304C



GET A FREE Network World Subscription!

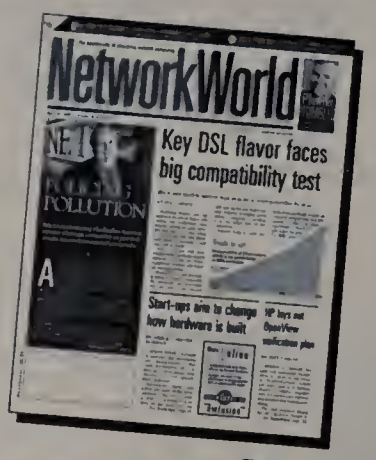
Apply on-line today at:
www.nwwsubscribe.com/nb700

Change of Address?

Keep NetworkWorld Coming!

Inform us immediately at
www.nwwsubscribe.com

SPREAD THE WORD TO YOUR COLLEAGUES!



Tear off a card below and pass it to a fellow network professional who might want a **FREE** **Network World** subscription!

Get A **FREE** NetworkWorld **Subscription!**

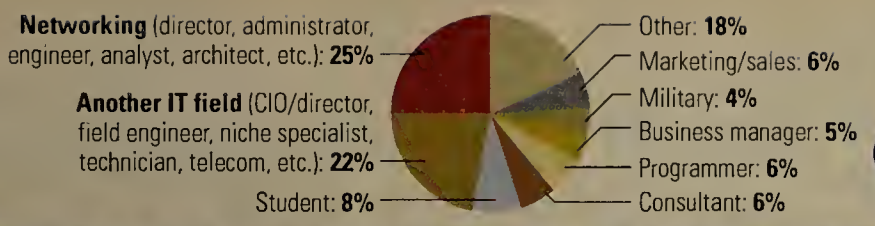
APPLY ON-LINE TODAY AT:
www.nwwsubscribe.com/pb700

Get A **FREE** NetworkWorld **Subscription!**

APPLY ON-LINE TODAY AT:
www.nwwsubscribe.com/pb700

Your Job

PRIOR TO YOUR CURRENT JOB, what did you do? (368 You survey respondents)



ODD JOBS you've had:

- Milk maid: "My parents own a dairy farm in Ohio."
- Postman
- Satellite controller
- Farm foreman

CLINT MILLER
IT director, TIS Insurance Services
FORMER LONG-HAUL TRUCKER

Your life before networking

By Sandra Gittlen

FROM TRUCK DRIVERS TO MOUNTAIN CLIMBERS, PEOPLE FROM ALL WALKS OF LIFE ARE BRINGING THEIR NONTRADITIONAL EXPERIENCES TO NETWORK JOBS.

Talk to Clint Miller about traffic and he'll ask you which kind: network or highway. An expert in both, Miller likes to punctuate his daily grind as IT director at TIS Insurance Services in Knoxville, Tenn., with tales about his days driving a semi.

Miller, being an ex-trucker, may seem an anomaly. But today's insatiable need for IT professionals is letting job candidates show up on corporate doorsteps with resumes that look like patchwork quilts. These rich dossiers point to the growing trend of switching from one career into networking. And once outsiders break into IT, it seems unusual expertise helps move them quickly through the IT ranks.

Life on the real-life superhighway

In the early 1990s, Miller worked counterintelligence for the Drug Enforcement Agency (DEA). Having no formal computer training, he got the job through a stint in the National Guard helping create and maintain a joint National Guard-DEA database of drug dealers. "I was doing troubleshooting and being a techie," he says.

But boredom soon set in, and in 1994, Miller quit the DEA. "I left the computer realm to chase a boyhood dream of driving a semi," he says.

Miller started out his adventure as a mover driving a flatbed. Then he switched to operating big rigs. He spent countless hours on the road, driving between New York and California. "I drove an express route, which meant only stopping for fuel," he says. "I carted anything that had to be there in a few days. I went back and forth twice a week."

Miller spent two years on the road, then realized it was time to grow up. With his first child on the way, Miller headed back to college. But rather than finishing his degree, he taught himself networking and studied to be a Certified Novell Engineer. He landed an entry-level job at TIS in 1997 and worked his way up to the director position last year.

But Miller says he wouldn't trade those driving days for anything. He even says that experience has helped him be a better network engineer. "There are so many things to maintain on a truck," he says. "You have to balance your load, know your weight limits, track the life span of parts and know what needs to be upgraded when. You also have to be detail-oriented and be able to multitask."

And what about the traffic? "While you're hauling 80,000 pounds at 85 miles an hour, you have to be aware of everything around you — the cars, the traffic," he says. The same applies for computer environments, he adds: "You have to know your load, your capacity and what else is happening on the network."

The fingernail test

Past experience also comes into play for Jim Crump, who recently left his job as chief technologist at EDS Huntsman for a technical position elsewhere. Whenever he had a tough network call at EDS Huntsman, he did the fingernail test. "I asked myself, 'Would I hang myself over a cliff on this one?"

It seems pretty drastic for a network call at the Houston petrochemical company, but this former professional mountain climber is used to extremes. Crump first went climbing when he was 4 years old. "My father . . . didn't want to carry me, so I stormed the summit," Crump says. By the age of 5, he had camped in almost every major national park in the

U.S. during family vacations. By 10, he was "locked into the idea of being a mountaineer."

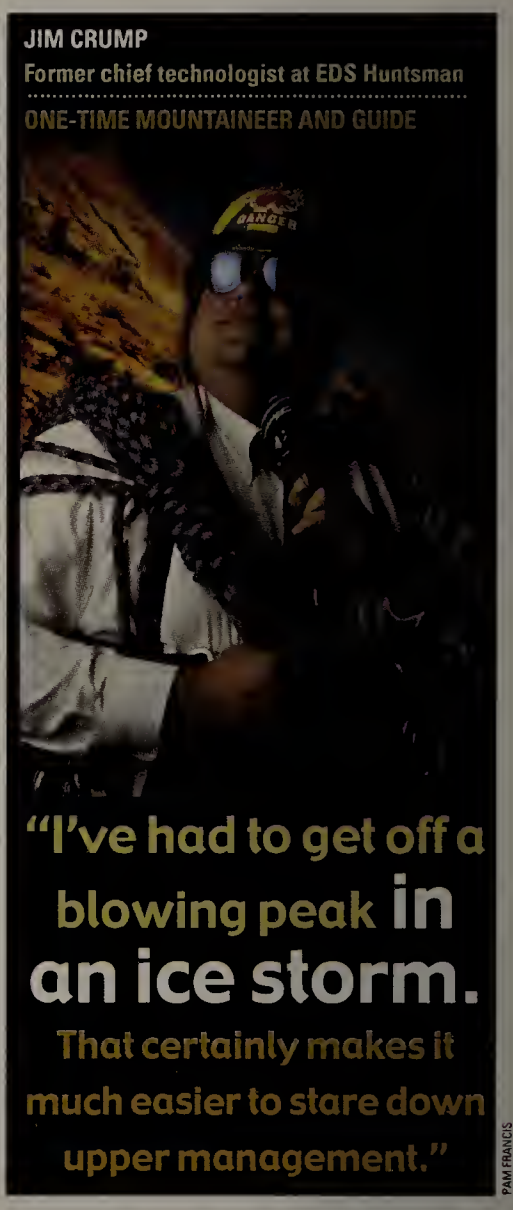
In his late teens, Crump settled into work as a guide at Enchanted Rock State Park in Austin, Texas. He had a range of tough peaks under his belt by the time he entered the University of Texas, also in Austin, to study physics.

Crump started his own climbing guide service at Enchanted Rock in the early 1980s, while he finished his degree. He managed a team of seven guides that serviced the Austin, Dallas, Houston and San Antonio metropolitan areas. By his mid-20s, Crump had a successful guide service and a published book, *Dome Drivers Manual: A climber's guide to Enchanted Rock*, about his experiences. He had also scaled peaks in El Capitan, Yosemite and Baffin Island parks.

But a few years later he burned out. "I went through a divorce and needed a change," he says. So he signed on as a data entry clerk with Texaco Chemical's Austin Research Labs. Crump says he got the job by talking about climbing during his interview; his future boss was interested in the parks he traveled.

While an operations manager with Huntsman, which bought the lab, Crump says he was always on call. "That pretty much shut down my climbing," he says. Until then, he had taken every opportunity — weekends, holidays and vacations — to keep up with what was now his hobby, climbing. "I got to be the old man of the park," he says.

Although Crump misses his climbing days, he says skills he mastered high atop the mountains helped him do his job better. Huntsman outsourced his group to EDS in 1995, and Crump rose to chief technologist three years later. He was charged with building the infrastructure for EDS Huntsman's global business.



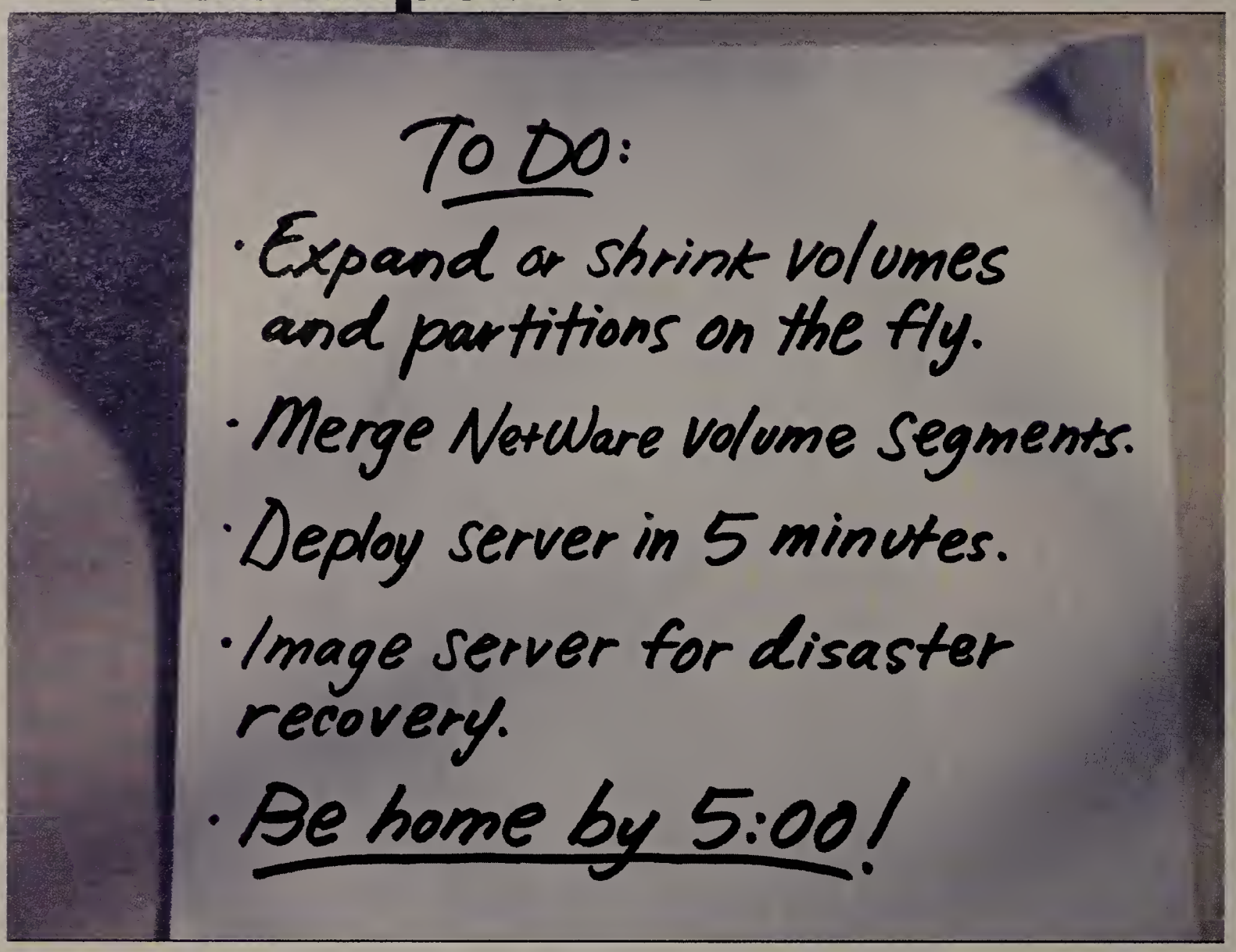
"That certainly makes it much easier to stare down upper management," Crump says.

Crump also says his ability to assemble teams to summit a mountain came in handy when creating project groups. "I shared my war stories to break the ice. They gave me a personality other than my technical face," he says.

Best of all, his climbing has given him the fingernail test, which came

See **Life,** *page 94*

Do the impossible...



With ServerMagic™ 3.0, the fastest way to manage your server is also the fastest way out of the office.

The load placed on today's IT professionals is staggering. Maintaining a network, as well as a personal life, demands the impossible. Fortunately, that's exactly what ServerMagic 3.0 delivers. As the only network management tool with the power to safely and painlessly upgrade your hard drive and modify your server's partitions on the fly, ServerMagic lets you quickly copy and expand entire NetWare,® NT Server and DOS partitions directly from one hard drive to another. All without losing a single trustee right, directory setting or byte of data. And ServerMagic works with hardware RAID systems for greater compatibility. ServerMagic 3.0 can help even the most experienced IS professionals save hours transferring the data from their old hard drives to their new ones. Which means more free time out of the office and less stress in it. To experience the difference ServerMagic will make for you, visit our website at www.powerquest.com/ad or call us at 1-888-497-9998.

POWER PQ QUEST

To get your evaluation copy, call PowerQuest at 1-888-497-9998.

www.powerquest.com

© 1999 PowerQuest Corporation. All rights reserved. U.S. Patents 5,675,769 and 5,706,472. Other patents pending in the U.S.A. and elsewhere. PowerQuest is a registered trademark, and ServerMagic and Server Image are trademarks of PowerQuest Corporation in the U.S.A. and elsewhere. All other brand and product names are trademarks or registered trademarks of their respective owners.

The YOU Issue

EXECUTIVE PROFILES

A Special Advertising Section

Robert A. McCormick
Chief Executive Officer
SAVVIS Communications Corporation
(800) SAVVIS-1
www.savvis.net

SAVVIS Communications Corp. (NASDAQ: SVVS) is the premier service provider of Intelligent IP solutions, and the first to deliver Internet economies to private IP networks. SAVVIS' global IP platform provides a full range of customer-specified Internet, Intranet and Extranet networks, combining the fle xibility and fast-time-to-market of the Internet, with the QoS, security and reliability of Private IP networks. Its Financial Xchange™ services platform currently connects to more than 4,700 financial institutions worldwide.

TelekomNet
Everything Telecommunications - Everything Networking

TelekomNet, Inc.
(877) 346-9500
www.telekomnet.com

TelekomNet, the global business-to-business vertical marketplace and interactive knowledge center for the telecommunications and networking industry, provides a better way for businesses to buy, sell, and learn about telecommunications and networking technologies and products. TelekomNet.com is the Internet's most complete site with direct e-commerce, industry news and in-depth featured articles on products and technologies. The site also offers a bandwidth marketplace, a used equipment auction, and online engineering for IT professionals.

Anthony DeKerf
President
Tron International, Inc.
(800) 808-4672
www.tron.com

Multi-Console KVM Switch Systems encompass many variations of this complex technology. And, new digital based KVM Switches will emerge to provide data centers an excellent solution for a world class, lights out operation while maximizing revenue per square foot. Our new industry White Paper reviews today's technologies supplying comprehensive details of each deployment.

Scott Stouffer
President and CEO
Visual Networks, Inc.
(800) 240-4010
www.visualnetworks.com

Visual Networks is the leading provider of service management solutions to manage the Internet infrastructure. The company's products include event and performance management solutions for New World service providers, enterprises, application service providers and dot-com companies. Visual Networks' award-winning products are deployed in the world's largest networks including AT&T, MCI, Sprint, Cisco, Fed Ex, BT Internet and ICG Communications.

Cynthia Provin
Chief Operating Officer
Zaxus, Inc.
(888) 744-4976 or (954) 846-4700
www.zaxus.com

Zaxus — A Thomson-CSF Racal Company. Zaxus is an established world leader in cryptographic security products and solutions for electronic payments, and for the safe exchange of value-bearing transactions among business and government. For more than 20 years, Zaxus has been at the forefront of security and payment technology and has a strong established track record in security in three distinct areas: Card Payments, e-Security, and Network Security.

All efforts have been made to make this listing as complete and accurate as possible. *Network World* is not liable for errors or omissions.

Continued from page 92

in handy when recommending strategies and designs for the company's technical architecture. "When you're hanging by your fingernails over the void, you don't have time to overanalyze. You just have to make a decision," Crump says.

The culture of networking

John Daly, assistant manager of IT at Toyota, also took a circuitous route into networking. While he knew he wanted to be in computers one day, he went in a different direction when it came time to pick his major in college.

"I studied Japanese first," he says. His rationale was simple: "Languages don't get obsolete, computer skills do. I could catch up and learn about computers later."

Daly reveled in the Japanese culture, earning his degree in Japanese and Asian studies from Connecticut College. He also studied economics. He went on to Harvard University where he worked as assistant director of the Asian Studies undergraduate program, and then headed to Japan "to work on language skills."

Daly landed a job as international relations coordinator in southern Kyushu in the early 1990s. He was the only American among 1,000 workers at Miyakonojo City Hall.

Daly took on the lifelong learning program for residents. "I developed programs to help them learn English, cross-comparative history, cooking — everything," he says.

During his four years there, he brought the Internet to City Hall. "I got them online and helped get a city Web site going," he says.

This prepped him for his return to the states. Daly signed on with the Japan External Trade Organization (JETO), a worldwide nonprofit group that helps small to midsize U.S. companies invest in or export to Japan. As director of business development for JETO, Daly worked with companies to create technologies that would improve Japan's health care system.

"Languages don't get obsolete, computer skills do. I could catch up and learn about computers later."

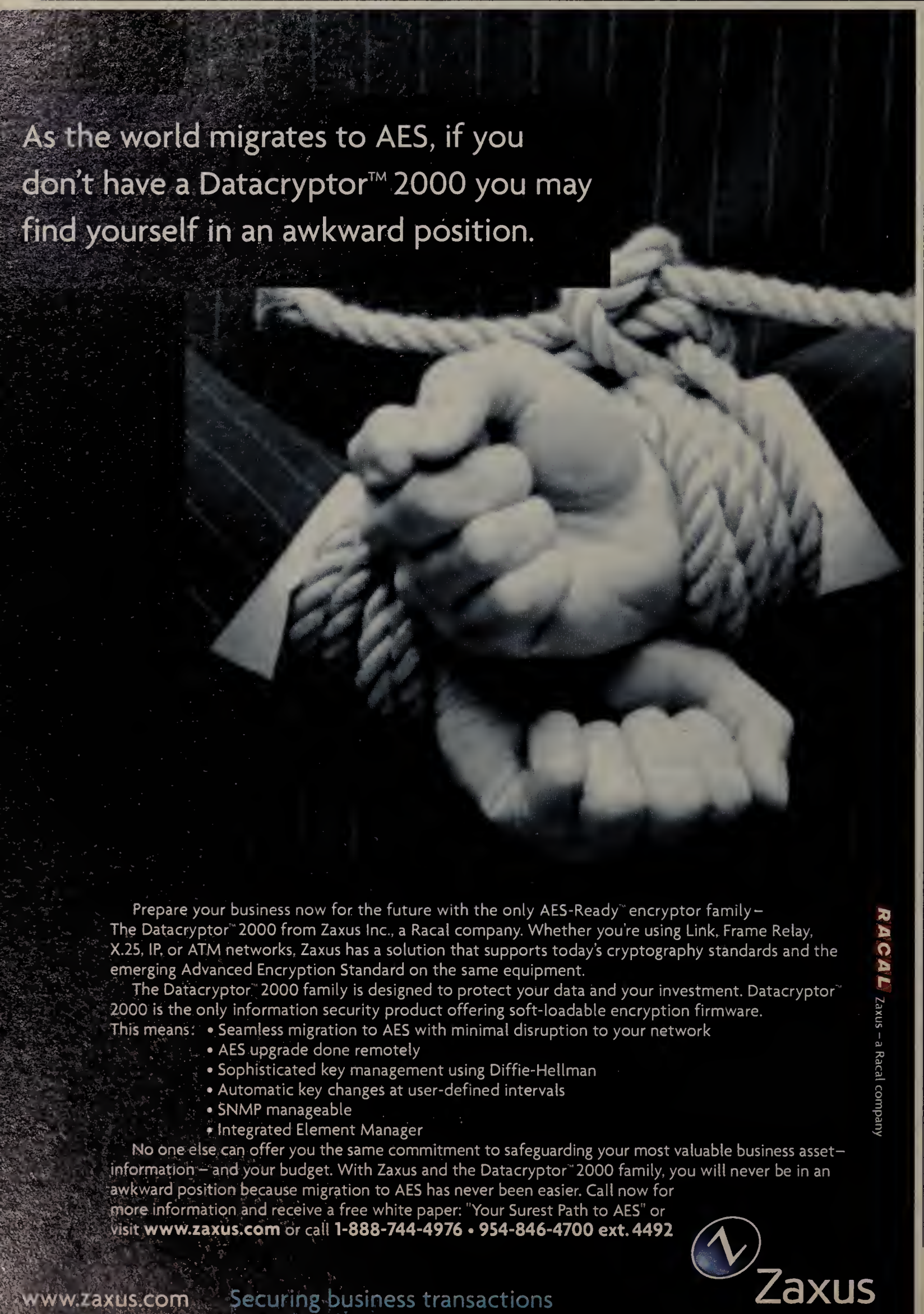
JOHN DALY
Assistant IT manager, Toyota
FORMER INTERNATIONAL RELATIONS COORDINATOR

His work with JETO led him to Japanese car manufacturer Toyota, where he took a managerial position in IT last year. "Toyota wanted to bring in someone who had a track record of understanding how things worked here and abroad," says Daly, who works in New York.

His time in Japan has proven invaluable. "An engineer who doesn't speak Japanese needs to communicate with the Japanese team on a level that's understandable," he says. "With my experience, I act as that liaison."

One of Daly's responsibilities is to assess IT trends in the U.S. and report how they could benefit Toyota. "High-level managers here and abroad don't have time to waste. They want to see case studies of how people are carrying out trends [such as business-to-business exchanges]."

Next up on Daly's agenda? A tech education.



Signature Sign Off

Put your career choice to the test

By Paul McNamara

Anyone can be an ace network executive when all systems are flying high and the boss is out of town. But tougher stuff is required when the bits hit the fan and your best-laid plans are swirling around the room. Under these circumstances, even an IT lifer can question his or her choice of profession. Take this personality test to help determine whether those fears are well-founded.

ILLUSTRATIONS BY LARRY JOST

1. The CEO just zipped you an urgent memo ordering your entire workforce be equipped with the most feature-packed and expensive Web-enabled cellular phones because his wife got him one and "they are clearly the future of e-commerce." Do you:

a) March into the office of your supervisor and demand that he tell the CEO exactly what he can do with his Web enabled phone.

b) Wonder aloud whether there exists a handbasket big enough to carry your company to its inevitable destina tion.

c) Reply to the CEO's memo with an e mail commending him for his visionary decision and asking whether he has any particular color in mind for those phones.

2. A headhunter calls and offers you the chief information officer spot at an Internet start-up that's been called "the next Yahoo" so many times that the founders actually named the company Next Ya Who. Do you:

a) Ask whether starting on Monday would be soon enough for your new bosses.

b) Suspect the voice is that of Rocco the mailroom guy, who you have used to execute similar pranks, and begin plotting your revenge against Joe in the next office. You're just sure he's behind this.

c) Politely explain that "no pile of stock options can get me to turn my back on the people here who have treated me more like family than an employee."

3. The company's top bean counter tells you he just read about application service providers in an airline magazine that said a company could save 25% of its IT budget by outsourcing e-mail. Do you:

a) Explain that most e mail outsourcers offer "all the accountability of a dot com delivery promise at Christmas time because they hire nothing but corporate IT rejects."

b) Summon your e mail administrator into your office and ask if he's seen the latest redesign of www. monster.com.

c) Thank the chief financial officer for having brought the article to your attention and ensure him you'll give the idea due consideration before steering the conversation to what you know is his favorite pet project: recycling used CD ROMs.

4. The director of your company's human resources department has convinced upper management that only the strict filtering of employee e-mail and monitoring of Internet usage will prevent an inevitable wave of sexual harassment lawsuits. Do you:

a) Tell your boss you "would rather quit and drive a taxi cab than grind the jackboot of fascism into the necks of my fellow working men and women."

b) Spend the remainder of that workday scrubbing your own e mail files and hard drive.

c) Immediately buy the appropriate filtering software and launch a pilot program directed at a test subject: the director of your company's human resources department.

5. One of your network administrators tells you his "conservative estimate" is that 20% of your company's overly taxed bandwidth is being consumed by workers downloading music from Napster and other MP3 file-swapping sites. Do you:

a) Make a mental note to grab the latest Pearl Jam single before the lunch hour rush slows your network to a crawl.

b) Nod knowingly rather than admit you don't have a clue as to what Napster might be.

c) Long for the days when bootleg music only came on eight track tapes and warped vinyl.

6. Marketing has another bright idea for a stunt promotion involving scantily clad models that you figure will quadruple traffic on your Web site, which is ill-equipped to handle a spike half that size.... And it's given you only a week to prepare. Do you:

a) Grab the marketing director by the collar and explain to him what happens to e commerce companies that throw such parties without renting a big enough room.

b) Decide that next week is as good a time as any to use up those vacation days you carried over from last year.

c) Call an emergency IT staff meeting and authorize your employees to spend whatever is necessary to make sure your site passes this fire drill.

7. Stanley in accounting has done something stupid ... again. Last time he left his laptop — and the company's entire fiscal year 2001 budget plan — at an airport shoeshine stand. This time a floppy he brought to work contained the latest strain of the Melissa e-mail virus, which spread throughout the building and sent an obscene message to the first 50 names on almost every employee's Outlook contacts list. Do you:

a) Burst into the CEO's office and stammer, "Either Stanley goes, or I go."

b) Smile wanly and mutter, "Hey, you shouldn't be in this business if you're going to let the Stanleys of the world get you down."

c) Issue Stanley an abacus and a slide rule on the theory that he can't do much harm with those tools.

Grading scale

IF YOU CHOSE (a) for more than three of the questions, you have the right temperament for the job provided that you care little about career advancement.

IF YOU CHOSE (b) for more than three of the questions, you may want to discuss those medication levels with your doctor.

AND FINALLY if you chose (c) for more than three: Congratulations! You're CIO material.

A Growing Data Center.

A Scalable KVM Switch System.

Piece Of Cake.

The Internet is exploding, driving ever-larger data centers. So network administrators need KVM switch systems designed to handle growth. Cybex's server management solutions let you access and control hundreds of servers. Anytime, from anywhere. And Cybex solutions are scalable to grow with your data center. Check out our **XP4000 Series** at **www.cybex.com**, or call us at **800-932-9239**.

See how we can put effortless server control at your fingertips.

CYBEX®
COMPUTER PRODUCTS CORPORATION

Remote Server Access | **Multi-platform Server Support** | **Data Center Management** | **Multi-user Control**

Cybex, the Cybex Logo, and XP are trademarks or registered trademarks of Cybex Computer Products Corporation.

www.samw.com

Internetworking

LAN

WAN

in this Whole Wired World

there's only one place to get Free Cisco Support For Your Network

Cisco Pre-Sales

Cisco Post-Sales

Cisco Training

www.samw.com

SAMW

Cisco Systems Partner Silver Certified

104 West 27th Street 4th Floor New York, NY 10001
Tel: 212 242-3706 Fax: 212 367-9029

Your company's invested plenty in your network, and you're smart enough to administer it. You shouldn't have to keep paying every time you need a simple answer.

We Can Help

SAMW is a Cisco Systems Partner—Silver Certified, full-service systems integrator with top-level expertise in LAN and WAN Internetworking solutions and software development.

If you're launching an Internet-based enterprise, SAMW should be the first resource you look to. We'll have your site up quickly, keep you running, and our free Cisco support will keep your bottom line in top shape. **We'll even counsel you on excellent start-up financing opportunities.**

Our tech talent is certified in more technologies than we have room to list here. And the best part?

Our Cisco Tech Support Is Free

When was the last time you heard that in this world? Next time you need advice, click on over to *our* world.

www.samw.com

NO RISK Try and Buy Offer from Solunet

Test a new cache switching solution for the next 30 days FREE!

Right now, Solunet and Intel have a NO RISK offer for an affordable transparent cache switching solution. Combine the power of the Intel® NetStructure™ 1500 Cache Appliance with the Intel® Express 550T Switch to make the most of your existing network.

- Improve site performance
- Avoid user-site abandonment
- Free up web server resources
- Handle higher volumes of traffic

Leading the way in communication solutions.

SOLUNET Nothing But NETworks

Solunet is the Leader in Systems Integration

Solunet is an end-to-end solutions provider that specializes in consultation, configuration, installation, and tech support, for systems integration, networking and telecommunications. Solunet's solutions include a "best of breed" product line that ensures quality and provides you with a reliable network.

Call Solunet. Because your success depends on how knowledgeable your solution provider is.

Solunet Hot Products

Intel® NetStructure™ 1500 Cache

- Store information closer to the user
- Maximize bandwidth
- Deliver high-quality Internet Service

Intel® Express 550T Switch

- Simple GUI set-up
- Load balance between 4 cache servers
- Transparent cache switching

intel

SOLUNET

Best of Breed Total Solutions Provider
888.765.8638 • 321.676.7947
1571 Robert J. Conlan Blvd., Palm Bay, FL 32905

www.solunet.com

Video Security Management for NETWORKS!

- PC based Video Surveillance System
- *Live Video* over your Network!
- View 64 Cameras from any PC
- Monitor Alarms from any PC

MicroSwitcher(tm) PLUS for Windows95® and Windows NT®

MicroSwitcher is a Registered Trademark of Anderson Communications Inc.
Windows is a Registered Trademark of Microsoft Corporation

ACI International Inc.
www.aciconnect.com Toll free (800) 267-2288
Phone (905) 660-4460 Fax (905) 660-7544

HAVE YOU GOT WHAT IT TAKES?

WAVE TECHNOLOGIES INTERNATIONAL

You can follow in the footsteps of others. Or you can lead the way. Wave Technologies will help you get there. Our multiple media, self-study Career Packs give you the power to soar above the crowd. You'll gain the skills you need quickly, conveniently – on your own, at your pace, and on your way to the top.

Order Now and Save!

Buy an MCSE Career Pack and Get a CCNA™ Career Pack FREE!

CALL 800-603-4371

Offer expires September 29, 2000.

©2000 Wave Technologies International, Inc. Wave Technologies and the Wave logo are registered trademarks of Wave Technologies International, Inc. Thomson Learning is a trademark herein used under license. All other brand names mentioned herein are used for identification purposes only are trademarks of their respective owners.

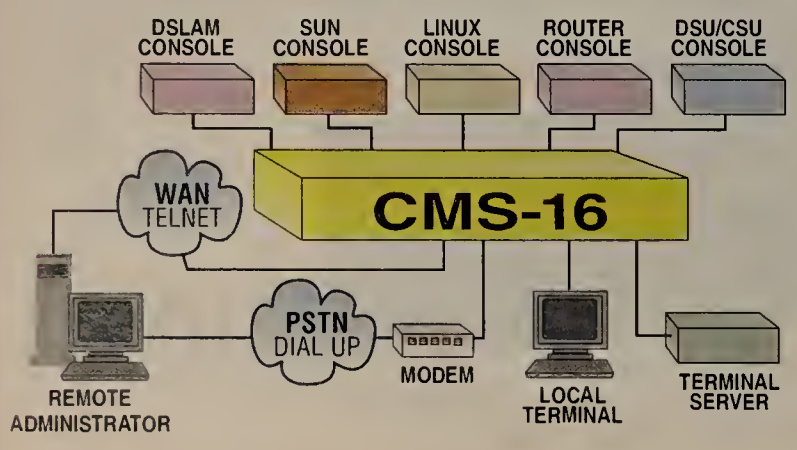
NW007AP

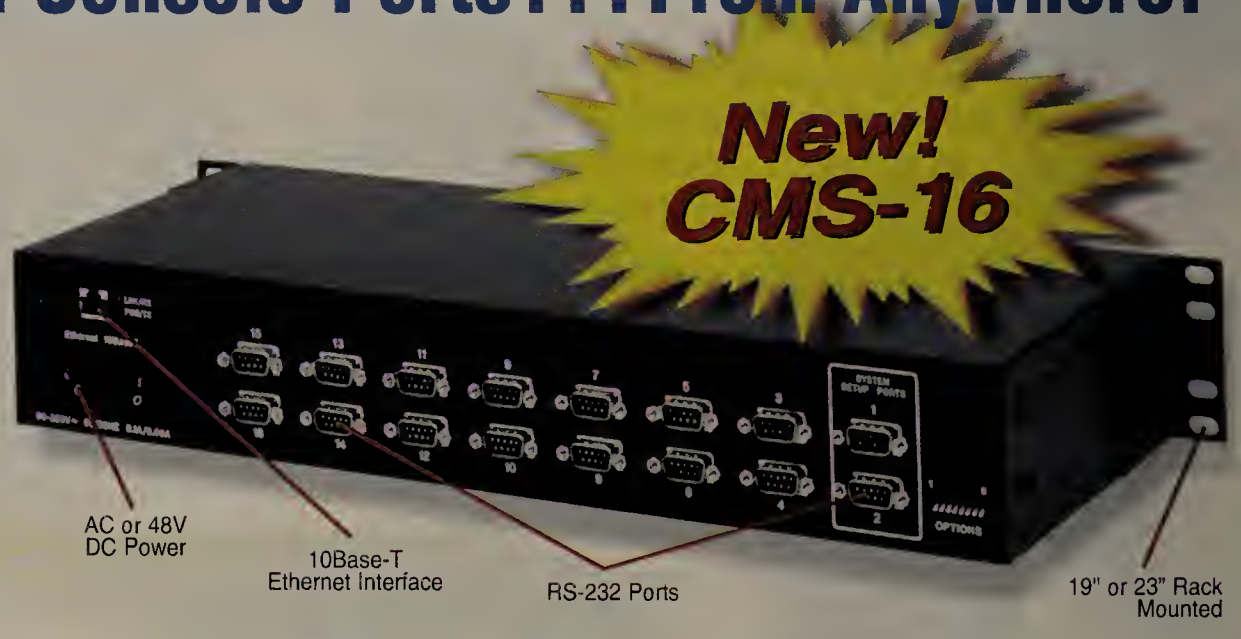
WWW.WAVELEARNING.NET

Console Management Over Telnet!

Access Network Serial Console Ports . . . From Anywhere!

The CMS-16 Console Management Switch provides secure, in-band and/or out-of-band access to RS232 console ports and maintenance ports on UNIX servers, routers, and other network equipment. System administrators can access remote devices in order to change configuration parameters, connect users to restricted ports, collect buffered data, and perform a variety of other control related functions.





- ✔ *Sixteen (16) RS232 DB9 Serial Ports*
- ✔ *10Base-T Ethernet Port*
- ✔ *TCP/IP Security Features*
- ✔ *Port-Specific Password Protection*
- ✔ *Non-Connect Port Buffering*
- ✔ *Modem Auto-Setup Command Strings*
- ✔ *Co-location Features*
- ✔ *AC and 48V DC Powered Models*

Visit website for complete NetReach™ product line.

wti western™ telematic inc.

(800) 854-7226 • www.wti.com

5 Sterling • Irvine • California 92618-2517 • (949) 586-9950 • Fax: (949) 583-9514

The KVM Network™

Consultation · Long Term Planning · System Designs · Sales

KVMS System Review · Installation & Service Contracts

Home
Accessories
Advanced
- Multi-Console
- Multi-Platform
- Remote Access
- KVMS Systems

ClassRooms
Converters
Desktop
Expansion
Extension
Mac-Sun
Professional
Server Models
Terminal Switch
USB-VGA

New Products
Discontinued

Other Products
KVMS White Paper
Service Plans
Sales Quote

Contact Tron

A New KVM Switch Index

Tron launched a completely revamped web site to include the most detailed and comprehensive index of keyboard, monitor, mouse switches, with extension and sharing devices available anywhere. The index currently includes products from fourteen manufacturers listed into more than a dozen categories to guide the user directly to the type of product under review. Once inside a specific category, the user can compare all of the available products from one menu.

KVMS Technology Seminar

Coming soon to a location near you!
Get the preliminary details and send a request to have your city included in the seminar's tour.

The Industry Standard

Keyboard/Video & Mouse Switch Technology White Paper

All New 2000 Revision

This document has been completely revised and updated to include an extensive review of the industry's multi-console KVMS Systems that will support the entire data center with distributed console access. In addition, we included a detailed look at the Category 5 Extension Technology that makes the interconnection between the hardware components of these large KVMS Systems. And, we updated the original material to provide you with the latest changes affecting the technology today.

Network and Dial-Up Access

Additional direct I/O services are available using your existing network infrastructure, or through dial-up connections for out-of-band remote access. Call for more information on the products and associated KVMS System.

The Center of KVMS Research

Tron has compiled the most comprehensive listing of KVMS products including a Product Descriptions, Component List, Technical Spec's, with the Features and Benefits. Large system topology's are included with special hints, tips and tricks to use in your own KVMS System design.

The KVM Cable™

STARTING AT: $15.00

6', PS/2, VGA, M-M or F-M

The KVM Cable provides three I/O services in a single tangle free cable. These highly shielded cables are perfect for demanding video resolutions. Combining all three KVM signals in a single cable helps you manage the concentration of cables attached in a KVM Switch installation!

Distributed Access to Keyboard, Video and Mouse Control

The KVM Network™ presents a new concept in Keyboard/Video and Mouse Switch (KVMS) technology. It is a fresh approach to new enhancements that provide data center operators with secured distributed access to thousands of computer systems.

The original KVM Switch allowed only one connected keyboard, monitor and mouse (console) attached to the box. Today's technology breaks the limitation of the original hardware by accommodating from four to over three hundred consoles co-existing on the same KVMS System backbone.

The latest in KVM Switch chassis use an integrated backplane with support for multiple data paths. A combination of KVM Switches and the middle components are interconnected using standard category 5 network cable. The chassis backplane determines the capacity for multi-console access to computers connected to that one box. The details of each KVMS Systems' component design and chassis capacity establishes the topology and guides overall deployment.

To easily understand the potential of direct remote access to the keyboard, monitor and mouse of your workstations and servers, consider your current network infrastructure. It consist of clients, servers, network hubs and the cabling backbone. An enterprise-sized KVMS System is comprised of a similar set of components consisting of two end pieces, a middle piece, and the cabling in between. The KVM Network™ simply defines the transmission of a different data set comprised of electrical data signals that control the computer system, in contrast to a standard network where data is being stored or moved between computers.

The KVM Network™ provides direct access and control of your computer peripherals from remote locations. The keyboard, monitor, mouse and even audio input/output devices no longer need to be positioned at each computer. You have complete access and control of any computer on the KVM Networks backbone from a statically positioned console.

Depending on the product selected, a KVM Network™ will support a range of platforms including PCs, Mac, Sun, HP, IBM and ASCII terminal devices. Internal components can provide the translation services necessary for the conversion of dissimilar protocols, allowing the user to select the type of control peripherals.

Are you sure you're getting the most from your KVM Switch System?

Want to know more?

800.808.4672

OBSERVER®

LAN/WAN

TROUBLESHOOTING

AND PROTOCOL

ANALYSIS SOFTWARE

SO OBSERVANT,

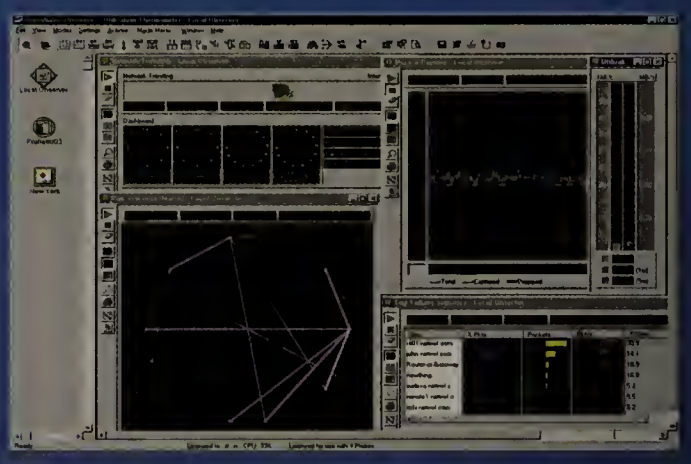
IT CAN SEE ALL PORTS

ON YOUR SWITCH.

- *Full packet capture and decode for over 300 protocols, including TCP/IP (v4 and v6), NetBIOS/NetBUEI, IPX/SPX, Appletalk, SNA, and DECnet.*
- *Switched mode sees all ports on a switch gathering statistics from the entire switch or packet capture from any port or ports.* ***Finally a protocol analyzer that can be used in switched environments!***
- *Long-term network trending collects statistical baseline data for days, weeks, months or years for review and reporting.*
- *Distributed version available for $1290 (includes 1 local and 1 remote Probe). Additional Probes are $295 per local or remote segment or switch.*
- *Network Instruments' optimized ErrorTrack™ NDIS drivers display true errors-by-station. Includes collision expert to identify problem stations.*
- *Track router utilization/traffic in real time*
- *Ethernet (10/100/1000), Token Ring, FDDI*

Observer identifies network trouble spots, and costs thousands less than expensive hardware-based analyzers. If you have network slowdowns would you know if they are being caused by packet errors, broadcast storms or overloaded utilization? Find out with Observer or Distributed Observer.

Observer's Extensions add to the functionality of Observer and Distributed Observer by providing SNMP object tracking, WEB browser based reporting, RMON1/2 Probe monitoring and Expert mode post-capture analysis - all within the Observer interface. Network Instruments' Probes are also available as RMON1/2 Probes for $295/each.



OBSERVER® 6

$995

OBSERVER EXTENSIONS

EXPERT EXTENSION FOR OBSERVER® $495

WEB EXTENSION FOR OBSERVER® $495

SNMP EXTENSION FOR OBSERVER® $495

RMON(2) EXTENSION FOR OBSERVER® $495

NETWORK INSTRUMENTS®

See what you have been missing! Call 800-526-7919 for a FREE DEMO or download from our web site.

www.networkinstruments.com

© 1999 Network Instruments, LLC - Corporate Headquarters (612) 932-9899 FAX (612) 932-9545, UK and Europe +44 (0) 1322 303045 FAX +44 (0) 1322 303056
info@networkinstruments.com www.networkinstruments.com Observer, Network Instruments and the "N" logo are registered trademarks of Network Instruments, LLC Minneapolis, MN USA

Stay on top of IT with Rose KVM Switches!

KVM is the industry acronym for Keyboard-Video-Mouse. KVM switches save money and space in your server room or on your desktop. Rose is a pioneer and leading manufacturer of KVM products.

UltraMatrix™

2 - 4 - 8 -16 users up to 1,000 computers

- Multi-platform for PC, Sun, RS6000,HP, DEC, SGI
- Advanced on-screen display technology
- Simple bus cabling makes expansion a breeze
- Switch computers from your keyboard or on-screen display
- Status screen shows system conditions at a glance
- Security features prevent unauthorized access
- Flash memory for free lifetime firmware upgrade
- Programmable view, share, control, and private modes

UltraView Pro™

1 user up to 256 computers

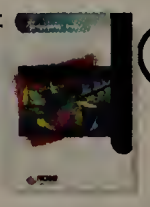
- Available in three different chassis sizes; either PC or multi-platform (PC, Unix, Sun, Apple)
- Advanced on-screen display technology
- Simple to use, keystrokes switch computers
- Flash memory for free lifetime upgrade of firmware.
- Supports up to 1600 x 1280 resolution
- Full emulation of keyboard and mouse functions
- Security features prevent unauthorized access
- Simplified cable management

Vista™

1 user to 2, 4, or 8 computers

- Low cost and easy to use
- Switch computers from front panel or keyboard
- Supports PC or PC/Apple
- Supports up to 1600 x 1280 resolution
- Plug and play
- Supports Microsoft intellimouse
- Tested with Windows 95/98, NT, Linux, and others

GET YOUR ROSE CATALOG TODAY



TOP PRIORITY

USA

10707 Stancliff Road Houston, Texas 77099
Phone 281-933-7673 Fax 281-933-0044

EUROPE

Bourne Works, High Street Collingbourne Ducis
Marlborough, Wiltshire, SN8 3EH United Kingdom
Phone: +44 126 485 0574 Fax: +44 126 485 0529

ROSE ELECTRONICS

WWW.ROSEL.COM

800.333.9343

your #1 source for remote network hardware management

AVAILABLE TODAY, WHY WAIT???

More Standard Control Options Than Any Other!

E-COMMANDER

JAVA BROWSER
SNMP & TELNET
VISUAL BASIC GUI
LOCAL CONSOLE PORT
INTERNAL MODEM

World's Largest Installed Base of AC & DC Switches!

POWER

POWER MANAGEMENT
UP TO 30 AMPS 250 VAC
& 200 AMPS 48 VDC
17 COMPLETE SOLUTIONS

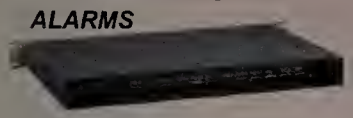
More Solutions & More Installed Than Any Other!

DATA

SWITCHES FOR RS232
CAT-5, V.35, RS422, VOICE,
ATM, VIDEO & UP TO 192 PORT
MATRIX SWITCHING

Complete Physical & Environmental Management!

ALARMS



ALARM GATHERING, REMOTE
HIGH LOAD CONTROL, CURRENT
MONITORING, THRESHOLD
ALARMING FOR TEMPERATURE,
CURRENT AND SECURITY ISSUES

E-COMMS INC
5720 144th Street NW
Gig Harbor, WA 98332
(800) 247-1431

See us at SuperCom

www.e-comms.com

CISCO

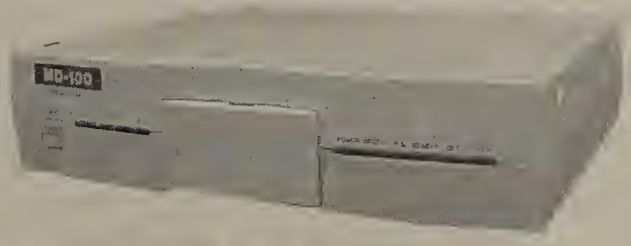
Buy • Lease Authorized Reseller Sell • Repair
New Refurbished Used

Nortel
3Com

WORLD DATA PRODUCTS

1 800 553 0592
www.wdpi.com
Email: cisco5@wdpi.com

Cisco Systems Reseller



Now a video server with full-duplex audio

Remote monitoring with camera control ...

Digital Image, Inc. Tel. (408) 257-9057 Fax. (408) 257-9674
10050 N. Wolfe Rd. 2-240, Cupertino, CA 95014
View our live demos at: www.dii-megachips.com

MD-100 TCP/IP Camera Server

- 4- Video Inputs
- Video Compression
  RVC Method - Proprietary form of motion JPEG
- Image Resolution
  640x480/240, 320x480/240
- Cable Connections
  10 Base-T (Ethernet)
  RS232C ports, Alarm Sensor
- Remote Control Functions
  Pan, Tilt, Zoom
  Camera Selection
- Supported Protocols
  TCP/IP, PPP, HTTP,
  FTP, Telnet, SNMP, IEEE802.3
- Physical Dimensions
  9.5" x 8" x 2.3", 3 lbs.

SNMPc Enterprise Manager

Distributed management for Windows NT. Supports remote consoles and polling agents, Web Trend Reporting and more.

SNMPc WorkGroup Manager

Affordable management for small networks. With an installed base of over 60,000 copies, this popular tool is resold by major OEMs, including Cisco and ACC.

Network Management
for Microsoft Windows

Castle Rock Computing
Phone: 408.366.6540
Fax: 408.252.2379

Download a Free Evaluation
www.castlerock.com

BayTech

Reboot Locked Equipment... Anytime from Anywhere

When network equipment is locked, there is no better way to reboot than with BayTech's RPC product line.

- Turn on, off or reboot all receptacles
- 15- or 20-Amp models available
- Models accessible via Ethernet (Telnet), RS-232 or dial-up
- Multi-user interface for co-location installations
- Built-in surge suppression
- 115V AC and 220V AC models available

NEW FEATURES AVAILABLE

- Know when you are reaching the capacity of your 15- or 20-Amp circuits with TRUE RMS Current Reporting
- Audible and LED overload alarms
- Vertical mounting for large data center applications

Horizontal Mount

www.baytech.net 1-800-523-2702 or 228-467-8238

GNAT Box®

The Simple, Powerful & Affordable

Firewall

- Proven Firewall Technology
- Network Address Translation
- Unlimited User License
- High Performance
- Transparent Network Access
- Easy to Configure & Operate
- Remote Web Based Management
- Cost Effective
- Time Based Access Control
- URL & Content Filitering
- Email, Pager & SNMP Trap Alerts
- Email Proxy
- ISDN, xDSL & Cable Modem Support
- Win95/NT Management Client

ICSA CERTIFIED WWW.ICSA.NET Firewall

$ 995.00

1-800-775-4GTA

Web: http://www.gnatbox.com
Email: gb-sales@gta.com
Tel: +1-407-380-0220 Fax: +1-407-380-6080

Global Technology Associates, Inc.

LearnKey Self-Paced Computer Training

it just clicks

www.learnkey.com

1.800.865.0165

WINDOWS 2000	SESSIONS	VIDEO	CD-ROM
• Learning Win 2000 User Course	3	$145	$175
• Professional Administration	5	$365	$425
• Directory Services Administration	4	$325	Soon
• Network Infrastructure Admin.	5	$365	Soon
• Server Administration	Coming Soon!		

★Save on Windows NT Courses!

★FREE Windows 2000 Planning Video with Microsoft Certification Purchase!

Microsoft Certified Solution Provider

Learn From The Experts™

LearnKey

NT Server 4.0 • Cisco • Netware 5 • A+ • Network+ • Notes R5

CD-ROM • VIDEO • ONLINE

Upgrade your Career

Degrees in Telecom and e-Commerce

- Prepare for positions in network design, network engineering, and telecom management with bachelor's and master's degrees in telecommunications management.
- Apply your skills to careers in web design, e-commerce applications development, product and project management or e-commerce business strategy with an MS or MBA in E-Commerce.
- Locations throughout Northern California as well as online.
- Flexible schedules allow you to complete your degree while you work.

Golden Gate University is fully accredited by the Western Assaciation af Schoals and Colleges.

GOLDEN GATE UNIVERSITY

1.800.GGU.4YOU

www.ggu.edu

NEW "BREAKTHROUGH KVM TECHNOLOGY"

NTI DELIVERS THE ONLY KVM SWITCH WITH TRUE AUTOBOOT ELECTRONIC USB SWITCHING

For 2 CPUs . . . or . . . Up to 32 CPUs and 8 users!

KEEMUX-USBV-4

- 1900x1200 video resolution.
- All computers can boot simultaneously.
- Enjoy plug-and-play and hot-swapping capabilities.
- Compatible with USB-enabled PC's, MAC G3/G4, HPJ5000 & other USB-enabled UNIX computers.

ST-4X16 with CPU-USB

- Control PC and MAC computers with USB peripheral ports using one VGA monitor, keyboard and mouse.
- NTI offers true autoboot electronic switching. Other USB KVM switches require individual boot-up. Also supports MAC power-on.

Novell. tes TESTED & APPROVED

SUN READY

SPARC International Member

USB

Mac and the Mac logo are trademarks of Apple Computer Inc. registered in the U.S. and other countries.

CALL FOR THE NEW...

NTI Y2K CATALOG

NTI

NETWORK TECHNOLOGIES INC
1275 Danner Dr • Aurora, OH 44202
330-562-7070 • 800-742-8324 • FAX: 330-562-1999
E-Mail: sales@ntigo.com • www.nti1.com

The Two Key Technologies of DSL the Easy Way™

IPacket™

Extending the ease of use and reliability of Ethernet throughout the service network results in an **easy-to-deploy network** that is **optimized** for IP services. By eliminating the complexity of ATM and Frame Relay from this portion of the network, administration and configuration costs are greatly reduced. In addition, up to 20% of bandwidth previously lost to transport overhead is regained.

AutoIP™

The **AutoIP** Architecture provides the easiest to deploy DSL solution on the market, delivering IDSL, SDSL, ADSL, and T1/E1 rapidly with lower provisioning costs. Includes **AutoSync** line provisioning, **AutoConfig** configuration management, **AutoRestore** backup/recovery services, and **AutoFilter** traffic management. Together, these services deliver IP broadband services simply and easily.

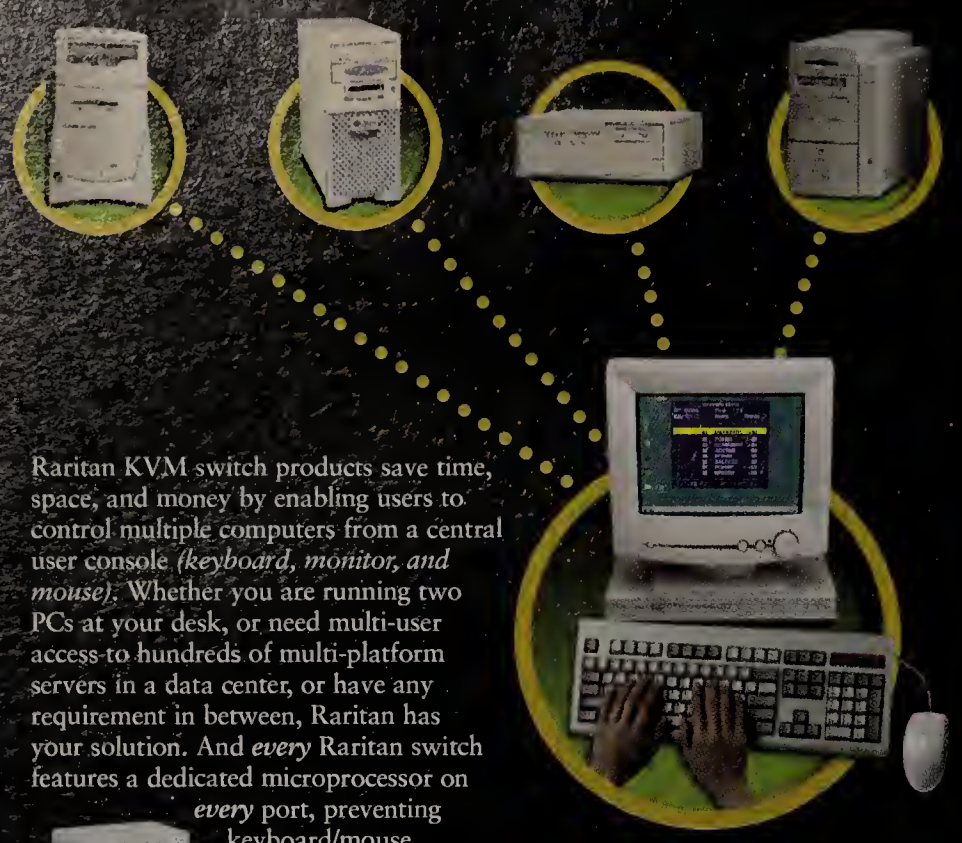
NET TO NET TECHNOLOGIES

www.nettonettech.com
contact@nettonettech.com

Corporate Headquarters
112 Corporate Drive, Suite 1
Pease Int. Tradeport
Portsmouth, NH 03801
877 638 2638

European Headquarters
Victoria House
19 parkway, Newbury
Berkshire England RG14 1EE
44 1993 772 228

Control 2 to 256 computers with just one pair of hands.



Raritan KVM switch products save time, space, and money by enabling users to control multiple computers from a central user console *(keyboard, monitor, and mouse)*. Whether you are running two PCs at your desk, or need multi-user access to hundreds of multi-platform servers in a data center, or have any requirement in between, Raritan has your solution. And *every* Raritan switch features a dedicated microprocessor on *every* port, preventing keyboard/mouse lock-up and ensuring flawless operation.

www.raritan.com
1-800-724-8090, X83

Reliability runs in the family.

Remote Reboot Power Management

The Pulizzi Engineering IPC 3301F

More than a remote power switch, the IPC 3300 Series provides a true network ready AC Power Controller with both in-band and out-of-band communications.

- RS-232 communications port with RS-485/422 high speed daisy chain data bus
- Stackable! Up to 10 IPC's at a single address
- Dasiy chain up to 36 IPC's over 4,000 feet for power control of 288 ports
- Selectable baud rates that allow users to optimize the data transfer rate

Ethernet Ready with MSS1 Converter

- IPX (Novell NetWare), TCP/IP (Unix) support
- GUI-Based utility for easy installation and support
- RJ45 10 Base-T Ethernet interface connector
- RS-232 Serial Interface cable included

Call today for a FREE design guide, 800.870.2248 · fax: 605.334.4999
online: www.pulizzi.com · email: sales@pulizzi.com

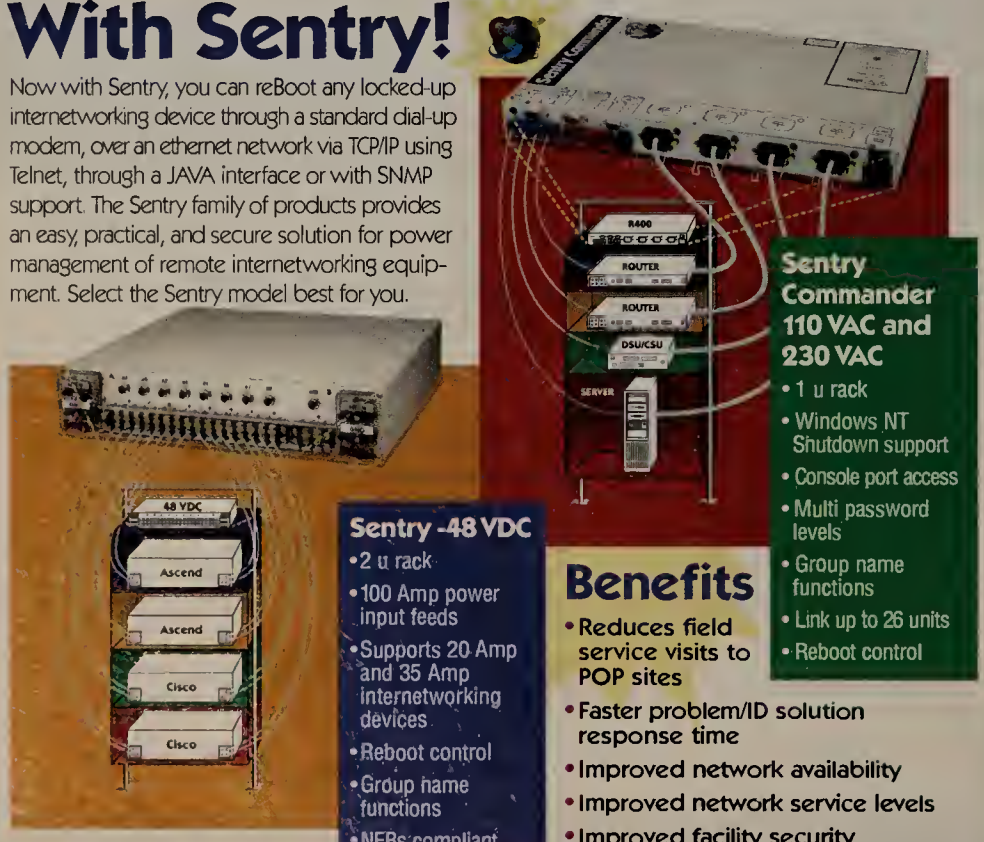
Pulizzi Engineering Inc.
3200 S. Susan Street
Santa Ana, CA 92704-6865

See us at Networld+Interop Atlanta 2000, Booth #6873

How Do You ReBoot Remote Equipment?

With Sentry!

Now with Sentry, you can reBoot any locked-up internetworking device through a standard dial-up modem, over an ethernet network via TCP/IP using Telnet, through a JAVA interface or with SNMP support. The Sentry family of products provides an easy, practical, and secure solution for power management of remote internetworking equipment. Select the Sentry model best for you.



Sentry Commander 110 VAC and 230 VAC
- 1 u rack
- Windows NT Shutdown support
- Console port access
- Multi password levels
- Group name functions
- Link up to 26 units
- Reboot control

Sentry -48 VDC
- 2 u rack
- 100 Amp power input feeds
- Supports 20 Amp and 35 Amp internetworking devices
- Reboot control
- Group name functions
- NEBs compliant

Benefits

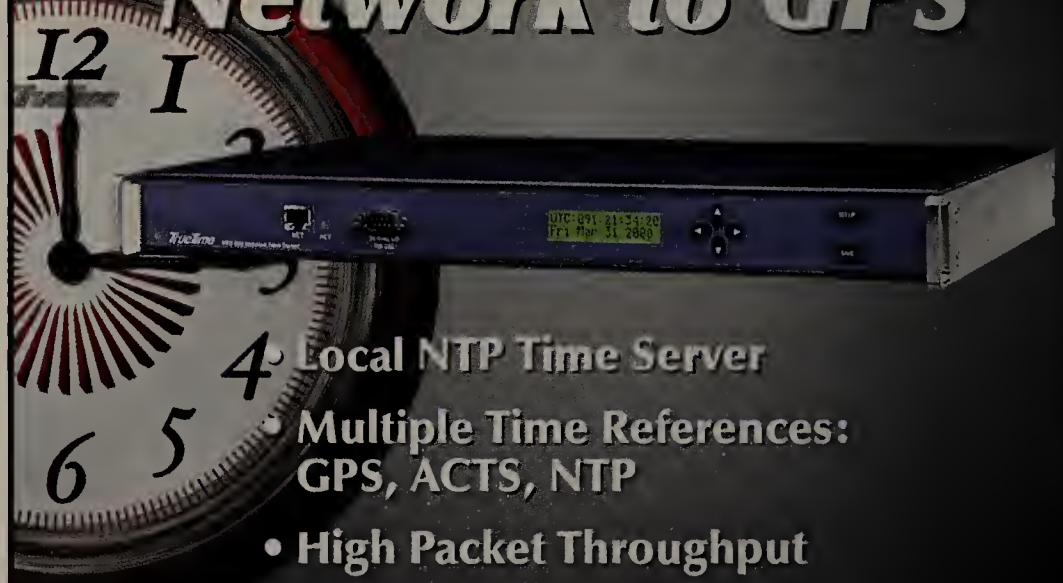
- Reduces field service visits to POP sites
- Faster problem/ID solution response time
- Improved network availability
- Improved network service levels
- Improved facility security

See our complete product line at:
Web: www.servertech.com
Phone: 1-800-835-1515 or 1-408-745-0300
Fax: 1-408-745-0392

Another great product from
Server Technology Inc.

©1999 Server Technology Inc. Sentry is a trademark of Server Technology Inc.

Synchronize Your Network to GPS



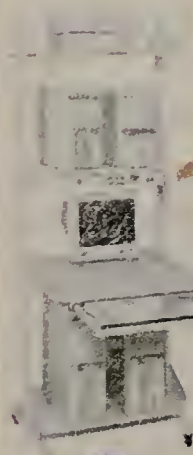
- Local NTP Time Server
- Multiple Time References: GPS, ACTS, NTP
- High Packet Throughput
- Enhanced Security Features
- Accurate, Reliable, Simple, Secure

www.truetime.com 800-328-1230 TrueTime®

The Hub of the Network Buy • The Hub of the Network Buy • The Hub of the Network Buy •

NETWORK MANAGEMENT SOLUTIONS

The New Keyport Millennia Series



Server Racks

LAN Furniture

Keyport Millennia Server grade KVM switch

- On Screen Display Menus
- OSD, Keyboard & Button Select
- Uses Standard Cables
- Password Security

Connect-Tek Direct

Contact our friendly experts for fast, reliable answers.
Telephone: (631) 981-3311
Fax: (631) 981-3828 / email: **sales@connect-tek.com**

Visit Our On-Line Store at:
www.connect-tek.com

Connect-Tek SINCE 1989
Connect-Tek, Inc. 153 Trade Zone Drive, Ronkonkoma, NY 11779
Direct from the Manufacturer - KVM Switches, Racks & LAN Furniture.

"Good As New" Networking Equipment
Good As New Warranties

Visit us On the Web @ www.nle.com

NORTEL NETWORKS
Bay Networks
CISCO SYSTEMS
3Com
CABLETRON SYSTEMS

- **Authorized** Nortel-Enterprise Solutions Provider
- **Free Technical Support** on Purchased Equipment
- **Free Network Design** Support
- **Largest Inventory** in the Industry
- **Best Priced** Memory Upgrades

888.891.4229

VISA MasterCard DISCOVER AMERICAN EXPRESS C.O.D's Terms

NLE

Phone 801-377-0074
Fax 801-377-0078
1403 W. 820 N. Provo, UT 84601

For More Information on Advertising in Network World's Marketplace
1-800-622-1108

CABLETRON • 3COM • CISCO • HP • NORTEL

MILLENNIUM
SOLUTIONS GROUP INC.

Specialist in all Cisco Products Including Memory LAN/WAN Products

We carry all manufacturers
Livingston • Ascend • US Robotics • Micom • HP
3Com • Adtran • Motorola • Codex • Wellfleet

We Buy and Sell ~ New, Used, Lease, Rent

- Routers, Bridges
- DSU/CSU's
- Switches, ATM
- Frame Relay
- Hubs, Modems
- Voice Over Data

888.801.2001 fax 916.630.2000
Visit our Website at: http://www.millenniumsolutions.net

Visit us online at
www.nwfusion.com

USED CISCO DIRECT
1-888-89-CISCO

VISA MasterCard

NETFAST
Save big on new/used:
➤ Routers ➤ Switches ➤ XDSL ➤ ATM
➤ ISDN ➤ Fast/GIGABIT/ENET ➤ T1/T3 DSU
➤ Frame Relay **BUY/SELL/RENT**

CISCO SYSTEMS PARTNER PREMIER CERTIFIED

➤ CISCO ➤ Ascend ➤ 3COM ➤ Digitol Link ➤ Lorscom
➤ Lucent ➤ ADC Kentrox ➤ Alteon ➤ Xyplex
➤ Adtran ➤ Porodyne
➤ Nortel Networks ➤ Foundry Networks

www.digitalwarehouse.com
DIGITAL WAREHOUSE
Your Information Superhighway Discount Source

Netfast Communications Inc., 56-29 56th Drive, Maspeth, NY 11378 USA
Phone: 1-888-892-4726 or 718-894-7500 Fax: 718-894-1573

For more information on advertising in the Marketplace,

everything, and call now!
800-622-1108 ext.6465

Made in U.S.A.

Factory Direct
Ethernet Converters, Transceivers, Repeaters & Switches

Fiberdyne	10BASET-10BASE-FL	$148
	AUI-10BASE-FL	119
Online Shopping!	100TX-100FX Converter	319
	10T-10FL Single	409
Online Catalog!	10FL-10FL Repeater	374
	10FLMM-10FL SM	895
	10FL-10FL Repeater SM	585
10/100TX-100FX 2 port switch MM		294
10/100TX-100FX 2 port switch SM		595
20 Slot Chassis 10T-10FL		$183 per port
20 Slot Chassis 100TX-100FX		$354 per port

www.fiberdyne.com

FIBERDYNE LABS, INC.
127 Business Park Dr., Frankfort, NY 13340
Tel. (315) 895-8470 Fax (315) 895-8436
FACTORY DIRECT SAVINGS

USED NETWORK HARDWARE

We just know more about...

CISCO

Routers • Switches • T1/T3 DSU/CSU • Access Servers • Cables • Memory

Buy • Sell • Overnight Delivery • Fully Guaranteed

800-451-3401
networkhardware.com

Shop Online!

Network Hardware Resale, Inc.

YOUR PREFERRED SOURCE FOR CISCO INTERNETWORKING EQUIPMENT & SERVICES

COST-EFFECTIVE COMPREHENSIVE INTELLIGENT

SELL LEASE, RENT, TRADE

INTERLINK COMMUNICATIONS CORP. IS YOUR CISCO SPECIALIST OFFERING CISCO-CERTIFIED TECHNICAL SUPPORT, 90-DAY PRODUCT WARRANTY, AND AGGRESSIVE PRICING.

Fax 1.800.832.6539

InterLink COMMUNICATIONS CORP.

7667 Cahill Road • Suite 400 • Minneapolis, MN 55439
Phone: 612.944.3440 • Fax: 612.944.3534
www.interlinkcom.com • Email: sales@interlinkcom.com

SALE #2

PUBLIC AUCTION

IN THE MATTER OF:

INSURANCE HOLDINGS OF AMERICA,INC.

10am, Thursday, July 27 • Oriskany, New York (near Syracuse)

Inspection: Wed., July 26, 9am–5pm & 8am morning of sale.

Less Than 2 Years Old!

50,000 SQUARE FOOT BUSINESS CALL CENTER CORP. OFFICE FACILITY OF SERVERS & COMPUTERS

SUN ENTERPRISE SERVER 5501, 4501, Ultra 450 & 250, Ultra 5 Desktops, Ultra Enterprise 1 & (2)SPARC STORAGE DLT7000 • (7) SUN ULTRA SCSI RAIDS • (7) SUN EXTERNAL TAPES DRIVES • (24) HDD UPGRADE 18 GB CONSOLES • (4) HP LASERJET 4000N PRINTERS • (2) HP LASERJET 8000N PRINTERS • (200) IBM 300PL DESKTOPS, PII 333 - 400MHZ SYSTEMS • 15) IBM PENTIUM III INTELLISTATION PC'S • (30) IBM THINKPAD PENTIUM NOTEBOOK COMPUTERS • (4) IBM NETFINITY 7000 SERVERS • (5) IBM NETFINITY 5500 SERVERS • (64) IBM NETFINITY 3500 SERVERS • (3) IBM NETFINITY 3000 SERVERS • (200) PRINCETON 21" MONITORS • (20) PRINCETON E0710 17" MONITORS • (2) INFOCUS LITEPRO 725 PROJECTORS • COMPLETE SANYO SECURITY SYSTEM • CISCO ROUTERS: 4000, 2501, 2524, 7200 SERIES • (2) CISCO PIX FIREWALLS • APC UPS SILICON WITH BREAKER - DP330E • APC SYMMETRA BATTERY BACKUP UNITS • (20) 3 COM 3900 NETBUILDER II'S • (10) 3 COM 3900 SUPERSTACK II SWITCH 36-PORTS • (50) 3COM HUBS • (3) 3COM NET-BUILDER II POWER SUPPLIES • (50) BACK-UPS PRO 420VA UPS & So Much More!

(350) MOD. WORKSTATIONS • EXEC. OFFICES • 100'S OF ERGO. CHAIRS • CONFERENCE ROOMS • $1.3 MILLION LUCENT PHONE SYSTEM

FOR BROCHURE, CALL: 888-875-SOLD

COWAN ALEXANDER EQUIPMENT GROUP
tel 818.340.3134 • fax 818.340.9883

www.CowanAlexander.com
Terms: Cash or Cashiers Check Only, 25% Due on Bid Award; 10% Buyers Premium.

TRAINING DIRECTORY

Cable University
(800) 537-8254
www.CableU.net
FREE online training in network cabling installation & maintenance

PMG NetAnalyst
(800) 645-8486
www.pmg.com
Network Analysis & Tool Training
Certified NetAnalyst Testing

Cyber Pass Inc.
(613) 237-4991
www.certify.com
CompTIA, Microsoft, Novell Exam Simulation Software.

TCIC
(800) 322-2202
www.tcic.com
Telecommunications + Data Comm., On-Site + CD's also available.

LearnKey, Inc.
(800) 865-0165
www.learnkey.com
Self-Paced Training for Computer Users & IT Professionals

Wave Technologies
(800) 711-0286
www.wavetech.com
MCSE, Cisco, MCSD, A+, Network+, CNE.Bootcamps, Online, Selfstudy

Contact these companies today to help you with your training needs!

800-783-8979
Fax 916-781-6962
We Carry ALL Manufacturers

Specializing In:
3-Com
Nortel
Bay Networks
Cabletron
CISCO
Ascend
Fibermux
Livingston
Micom
Motorola
Synoptics
Data/Voice Network Solutions

LAN/WAN
BUY/SELL
NEW/USED
RENT/LEASE
Fully Warranted
Switches
Hubs
Bridges
Routers
Multiplexers
T-1 Equipt
DSU/CSU
Modems

Alternative Data Communication Sources, Inc.
916-781-6952

www.adcs-inc.com

nsgdata.com, inc.

Specializing in legacy protocols over X.25, Frame Relay, IP and Wireless

Call 1.800.270.2669
or e-mail
info@nsgdata.com

Advertise in the Marketplace and watch your sales come pouring in
Reserve your space today!

Call Direct Response Advertising
1-800-622-1108

Coming Up in August

Issue	
August 7	• Test/Review: Personal Firewall, Part I.
	• Test/Review: Personal Firewall, Part II.
August 14	• Test/Review: File synchronization.
	• Test/Review: Network monitoring/ protocol analyzer.
August 21	• Test/Review: Buyer's Guide on SAN switching.
August 28	• Test/Review: Community software packages.
	• Test/Review: Automated backup.
	• Test/Review: Network monitoring.

Please note that technology updates, and comparative and test/review dates and topics are subject to change without notice.

FREE 3Com Palm V*

WE BUY USED NETWORKING

Palm V

HIGHEST PRICES PAID!

3Com
Bay Networks
Cisco Systems
CABLETRON SYSTEMS The Complete Networking Solution

*VISIT WWW.4LANWAN.COM TO ENTER TO WIN

WE SELL NEW & REFURBISHED
GIGANTIC DISCOUNTS / LONGEST WARRANTIES!

We maintain a huge inventory of parts & systems
We specialize in Legacy & hard to find items
Call, E-mail or Fax Your Equipment List.

4LANWAN.com
A Division of Ergonomic Enterprises, Inc.
47 Werman Court, Plainview, NY 11803

Celebrating Our 17th Year

CALL TOLL FREE: 877-4-LAN-WAN
FAX: 516-293-5325 / EMAIL: SALES@4LANWAN.COM

S.I.TECH
"Bringing Fiber to the Desktop"

www.sitech-bitdriver.com
Tel: 630-761-3640
Fax: 630-761-3644
Email: sales@sitech-bitdriver.com

All Routers and Switches make Connections...

BUY BIZI's Quality Pre-Owned Equipment & Connect for a lot less!

- 50-80% Savings off Retail List Prices
- 120-Day Warranty
- 100% 30 Day–Money Back Guarantee
- Large Inventory of Newer & Older Products
- In-House Knowledgeable Technical Support
- Supplying New & Quality Pre-Owned Networking Products for over 10 years
- Same Day Shipping

Also, Sell Us Your Unwanted Networking Equipment!
e-mail: purchasing@bizint.com

http://www.bizint.com

call us in the USA at:
(877) 438-2494 or (315) 458-9606
fax: (315) 458-9493

BIZI
Your global partners for new & quality used networking equipment
info@bizint.com

We Buy, Sell & Trade

Software Engineer req. by software dev. & consultancy comp. duties: System Analysis, Design and Function point analysis of various types of applications like Financial application, Payroll, Human Resource. Analyzing existing Application Identify User requirements. Designing and programming in POWERBUILDER 6.0, PFC, SYBASE, SQLANYWHERE 5.5, ORACLE 7.3. Develop the class libraries (Common Object Library) for various kind of applications. Knowledge of Sybase Replication Networking , Database Administration. Replicating the data from one sites to another site. Job to be performed at Apex, NC and various unanticipated client sites throughout the U.S. as assigned. Requirements: Masters Degree in either Math, or Engg or Sci, or Comp. Sci. and one yr. exp. in the job offered or one yr. exp. in the related occupations as Prog. Analyst & Analyst Developer & Group Leader in the job offered. Salary: $71,000/Yr. Hours: 40/hr work/wk, 9:am to 6:00pm. Applicants submit resumes w/Social Security No. to Job Order # NC5703318 & DOT code 030.062-010, Job Service – 742-F East Chatham Street, Cary, NC 27511.

Software Engineer

We are seeking a qualified candidate to design & develop state-of-the art system for diamond business.Utilize knwldg of Windows NT,Oracle (DBA & developing role) , VB (or C++, JAVA), PL/SQL,in improving system by modifying existing features or adding new ones to enhance efficiency. Research & analyze system req'mnts,as well as design,dvlp & implement inventory, purchasing, manufacturing, sales & accounting systems. Reqd: Master's degree in Comp. Sci., Engineering, Maths or equivalent & 1 year exp. Employer will accept Bachelor's degree + 5 years of progressive experience in the computer field. Pls mail resume to JDM Import Co., Inc., 1212 Ave. of the Americas, NY, NY 10036 or fax to 212-575-4688 Attn: HR Manager. No calls please.

SENIOR SOFTWARE ENGINEER to provide on-site consultancy in data design architect, system analysis and design, software programming, testing, training and implementation using HTML, Java Script, PL/SQL, HTP, HTF, relational database Oracle, SIBAS in DOS, Windows, Windows NT, UNIX, Solaris, and Sintran operating systems; provide logical and physical data model for client database and evaluate database architecture; supervise junior software engineers and programmers. Require: M.S. in Computer Science/Electronics Engineering and three years experience in the job offered. B.S. with five years experience may be substituted for M.S. and three years experience. 40% travel required to client sites within the United States. Salary: $80,000 per year, 8 am to 5 pm, M-F. Apply with resume to: Director of Human Resources, Enterprises Computing Services, Inc., 8744 Main Street, Suite 101, Woodstock, GA 30188.

Systems Analyst (Boca Raton, FL): meet w/domestic & international customers to determine specific needs, which vary from simple business-oriented applications to complex integration, such as SAP, EDI, Electronic Commerce, ANSI X12 transactions, using MERCATOR data transformation tool and its different across-platform products; design & create custom software to solve customer needs, configure systems to meet customer's requests & operate custom software; train final end-users & support implementation. Be able to integrate systems regardless of data origin & delivery location. Bachelor's in Computer Science. M-F, 9am-5pm. 40hr/wk, $41,371.20/yr. SEND RESUME TO LABOR DEPT./BUREAU OF WORKFORCE PROGRAM SUPPORT, PO BOX 10869, TALLAHASSEE, FL 32302. Attn: L.Knight. RE: JOFL #2091319.

E-Commerce Manager

We are looking for a qualified candidate to plan,design,test & maintain co's website, develop e-payments & e-credit capabilities, & develop electronic payment & personal profile information exchange standards to enable remote transactional capability using ASP, US, MTS,Java Script,Interdev & HTML. Develop & implement multimedia technology standards for use in online banking & bill presentment on various platforms. Analyze & develop specs., determine feasibility, cost & time req'd. Req'd: Masters degree in Computer Sci, Engineering or equivalent & 1 yr exp. Please mail resume to Asprey, Inc. 1466 Broadway, Suite 907, NY, NY 10036 or fax to 212-768-2101 Attn: Mr. Sevani. No calls please.

Senior Software Design Engineer: Perform analysis as it relates to an existing system; prepare design documentation and prepare associated time estimates; implement and/or lead project implementation; interface with product marketing, customer support, and other internal departments as needed to complete project implementation. Minimum Requirements: B.S. in Computer Science or the equivalent plus three years experience in the job offered or client/server application development. Prior experience must include a minimum of three years experience in client/server analysis, planning, design, and estimating; use of OO design techniques; client/server application development using C++, Solaris, and Oracle; and on-line transaction processing applications, particularly server processing on Sun Solaris. Hours: 8:00am - 5:00pm M-F. Salary: $65,000 per year. Must have indefinite right to work in the U.S. Contact: Tipton Bradford P.O. Box 105179, Atlanta, GA 30348-5179

Software Engineer

With experience in Unix based communication software to design, implement and test Network Management modules. Must have demonstrated ability in Unix, Winsock communication, socket programming, APL, SDK, and TCP/IP protocols; demonstrated ability in using VC++ and Microsoft Foundation Class (MFC) libraries; and experience in Object Oriented Programming Methodologies, Unix Systems and Windows NT/95 environment. Req 2 yrs exp in job offered or 2 yrs exp in Software Development. MS in Computer Science, Engg, Math or related field. Will accept BS plus 5 years of related experience in lieu on the MS degree requirement. Salary is $80,000/yr, 40 hrs/wk, 8:00 to 5:00 pm. Send two copies of resume to Job Order #19992548, PO Box #8968, Boston, MA 02114.

Software Engineer (multiple openings): Perform solution development, requirements analysis, research, design, implementation, testing and maintenance of custom solutions of client-server based information systems using C/C++, Visual C++ / MFC / Win32, ODBC/DAO, RDBMS (Oracle and Access), SQL and Visual Basic in Unix and Windows environment; perform object oriented analysis and design using Rational Rose. Must be willing to relocate on a project-to-project basis. Req.: MS or foreign deg. equiv. in Computer Science or closely related discipline. Hrs: 9a-6p, M-F, $63,500 per yr. Send resume to Axiom Systems, Inc. 2550 Northwinds Pkwy., Suite 440, Alpharetta, GA 30004 Reference No. YZ001.

A fast growing IT company needs Programmers, Programmer/Analyst, System Analysts & Software Engineers for New Jersey and Pennsylvania. All areas of expertise. Immediate need for a System Analyst with financial industry background. Person must have Bachelors' Degree in Finance or related field with at least an equivalent of one year of training or course work in computer field. Must be familiar with Oracle Financial and must have 3+ yrs. of experience in the field of information technology. Also needed a programmer/analyst. Must have a Bachelor's or equivalent with 2+ yrs. of experience as information technology professional. Send resumes to Innovative Solution Systems Inc., 501 Abbott Drive, Suite 1, Broomall, PA 19008; e-mail: iss@iss-soft.com.

eplanets, Inc, a PA IT Co., is looking for Exp. (a) Software Engineers (hvg Mast Degrees or Bach Degree w/5 yrs exp), abd (b) Programmer Analysts with Bach. Degree to fill up the following positions at their work sites at NJ & NY:

Exp. Must have combinations of Unix, C, C++, Sybase and CASE Tools; UNIX, C/C++, INFORMIX-4GL, INFORMIXSQL;

Database Administrators; Must have exp. Create/maintain/monitor databases. Backup databases & create recovery procedures to rescue data loss during system/database crashes. Use IBM DB2 & 3rd party tools/utilities.

Send resumes to HRD, eplanets Inc. 800 North Second St. Suite 100, Harrisburg PA 17102.

Senior System Administrator: Major international filtration firm seeks Sr. Sys. Admin to design, configure, install and maintain enterprise-wide computer systems for central and remote Unix, NT, and SUN servers; manage disks and logical volumes for large scale disk systems; analyze hw/sw utilization; upgrade and configure operating system, and do performance tuning. Requires 5 yrs exp. Sys. Admin. in Unix env, adv'd knowledge large scale disk management, expertise w design, installation and performance of enterprise-wide computer systems. Significant on-call for 7/24 Corp Data Center. Apply to: Paul Cavicchi, Millipore Corporation, 80 Ashby Road, Bedford, MA 01730.

Systec International, Inc, a NY IT Co., is looking for Exp. (a) Software Engineers (hvg Mast Degrees or Bach Degree w/5 yrs exp), and (b) Experienced Programmer Analysts with Bach. Degree to fill up the following positions at their work sites at NJ & NY:

Exp. must have combinations of Unix Administration, C, C++, Java, Informix, JDBC, Corba, NT Administration, Delphi, Web Development, Oracle, Oracle DBA, Oracle Developer, Visual Basic, Tuxedo, HP Administration, MS Office, and E-Commerce.

Send resumes to HRD, Systec International, Inc., 350 Fifth Avenue, Ste 7812, New York, NY 10118.

Manager, Engineering wanted by Applications Service Provider for job loc in Arlington, VA. Review business reqmts & write engg design specs for integration of ERP sys w/complementary enterprise sys. Manage the engg of information sys solutions. Manage implementation of enterprise, front-office & remotely hosted e-commerce sys. Develop standards for pre-configured business processes & template database. Must have Bach in Comp Sci, Industrial Engg or Mechanical Engg & 2 yrs ERP rapid implementation exp. Respond to: HR Dept, Corio, Inc., 959 Skyway Rd. Ste. 100, San Carlos, CA 94070 or fax: (650)232-3258. CORIO

Software Engineer II: plan, design, develop and implement client/user, server, voice, and related software and subsystems. Must have minimum Master's in Computer Science, 2 years experience (school or employment) in C, C++, Object Oriented technologies, Java, Smalltalk and/or Visual Basic, Unix/AIX, NT, DOS, CTI, CORBA, ISDN, CSTA, OMT tools, Windows API, and 6 months development of telephony systems, and present proof of legal authority for full-time employment in the US. M-F, 8AM-5PM, $63,451. Those interested and qualified, send resume or apply in person to GA Dept of Labor, Job Order 6521924, 1535 Atkinson Road, Lawrenceville, GA 30043-5601 or the nearest GA DOL Field Service Office.

Software & IT Dvlpt Firm in Syosset, NY seeks to fill the following positions:

1) Software Engineer -Must have Bach in Math, Comp Sci, Bus Admin or Engg or equiv & 3 yrs exp dvlpg & directing s/ware system testing procedures in VB, SQL & Active X

2) Software Engineer -Must have Bach in Math, Comp Sci, Bus Admin or Engg or equiv & 3 yrs exp dvlpg & directing s/ware system testing procedures in Lotus Notes, Lotus Script, HTML, JavaScript & VB.

Respond to: HR Dept, Metacrest Information Systems, 15 Albergo Lane, Syosset, NY 11791.

Intelligen, Inc, a NJ IT Co., is looking for Exp. Software Engineers hvg Mast Degrees or Bach Degree w/5 yrs exp. Exp. must include combinations of Unix, C, C++, Oracle and Win NT.

Send resumes to HRD, INTELLIGEN, INC. 2326 Morse Avenue, Scotch Plains, NJ 07076.

Reinsurance Co in New York, NY seeks to fill the following positions:

Senior Systems Developer-Must have Bach in Comp Sci, Math, Physics or Engg & 3 yrs s/ware exp.

UNIX Systems Administrator-Must have Bach in Comp Sci, Electronics or Comm Engg & 3 yrs sware exp.

Senior Systems Designer-Must have Bach in Comp Sci, Math, Physics or Engg & 3 yrs s/ware exp.

Respond to: HR Dept, St Paul Re, Inc., 195 Broadway, New York, NY 10007.

Director, Records Management. Miami. Plan, develop, & administer records mgmt policies designed to facilitate handling of business records & information for a management services Co.: Standardize filing, protecting, & retrieving records/reports/information contained on paper, microfilm, computer, etc. Proof of permanent work auth. in US & MBA in MIS req'd. Competitive salary. Send resume to: D. Deppen, HR Dept., Mapholding Co., 3401 NW 82 Ave, #100, Miami, FL 33122.

Computer System Engineer wanted by Comp Support Services Firm in Rockaway, NJ. Must have BS in Comp Engg & 2 yrs exp in systematical analysis & diagnosis of h/ware & s/ware problems in DOS, Win, Win NT, Unix, OS/2 operation systems & component level analysis of voice board & prgmg of voice boards.

Respond to: HR Dept, Tech Support, Inc., 159 Route 46, P.O. Box 515, Rockaway, NJ 07866.

Chief of Information Systems for information technology management & technical consulting services company. Degree + experience required. Competitive salary.

Resume to: Structured Intelligence, Inc., Attn. Ty Barrett, 1401 Brickell Ave, Suite 1010, Miami, FL 33131.

Business Systems Analyst/Project Leader, Oviedo, FL. Provide consultancy services at client sites, including application programming; tech advice & training; programming languages; software performance; investigate software performance problems; design & implement solutions; Project leader to remediate existing programs & test applications for Y2K compl. Requires: Bachelors in Business & 2 yrs. exp. $48,000/yr., 8 A - 5 P, M-F, 40/hrs. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. Re: Job Order 2094937.

SYSTEMS PROGRAMMER: Responsible for all phases of development, installation and modification of computer system and application software for industry. Must have B.S. in Computer Science or equivalent, and two years experience in the job offered. Mon-Fri, 40-50 hrs/wk., $65,000/yr, plus $37.50/hr. for time in excess of 40 hrs/wk. Please send resume to Bureau of Workforce Program Support, P.O. Box 10869. Tallahassee, Florida 32302-0869. Job Order No. FL-2086894.

System Administrator needed to plan, configure, install & maintain Sun Ultra Enterprise servers & for Oracle d/base admin.

Apply to Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

S/ware Dvlpt & Comp Consulting Services Co in Edison, NJ seeks Sr. Programmer Analyst. Must have Bach in Engg/Sci/Comp/Electronics & 5 yrs s/ware exp.

Respond to: HR Strategic Professional Services, Inc., 505 Thornall St, Ste 304, Edison, NJ 08837.

Systems Accountant. 8a-5p. Dvlp, install & implmt comp s/ware for fin'l & accounting Computerized paper acctg & record keeping functions using fin'l & acctg s/ware namely Lawson Insigt II Financial Suite, COBOL, Java, RDBMS, Oracle 8.0, Unix & Win OS systems in LAN or C/S envrmt. Master or equiv in Acctg, Finance, Comp Info Systms or related field. Job loc: Conyers, GA. Send resume w/r#0001 to: Vinod Jain, President, India House Brass, 1900 Sigman Rd., Conyers, GA 30012.

Forwarding co. req. computer systems analyst w/2 yrs exp to maintain and update internal computer network. Req. Bachelor's in Computer Science or equivalent.

Send resume & salary req. to HR Dept., Air Express Int'l, 120 Tokeneke Rd., Darien, CT 06820.

Associate Network Engineer wanted by California based Wireless Telecom Co for job loc in Reston, VA. Must have Bach in Comp Sci, Comp Engg or Math & 6 mos comp exp. Respond to: HR Dept, Wireless Facilities, Inc., 9805 Scranton Rd, Ste 100, San Diego, CA 92121.

Computer Systems Analyst wanted by Financial Services Co in Vienna, VA. Must have BS in Comp Sci or related field.

Respond to: HR Dept, USL Financials, Inc., 501 Church St NE, Ste 200, Vienna, VA 22180.

DATABASE MANAGER
For mid-Suffolk school district. Familiarity with COGNOS and ORACLE essential. Bachelor's degree and five years experience as programmer analyst required. Successful candidate will receive provisional Civil Service appointment and be required to take exam when given. Salary $54,150.
Resumes by July 28, 2000 to:
Ms. Louise P. Patejdl
Executive Administrative of Personnel,
EASTERN SUFFOLK BOCES
201 Sunrise Highway,
Patchogue, NY 11772

Software Engineer sought by Computer Career Placement Co. in Charlotte, NC. Must have Masters in Engg, Sci, Math or equiv & 2 yrs exp dsgng, dvlpg & testing in Oracle, SQL*Loader, SQL*Plus, Forms or PL/SQL.

Respond to: HR Dept., Baytree Associates, 4944 Parkway Plaza Blvd. Ste. 360 Charlotte, NC 28217.

Software Engineer wanted by Newspaper Publisher/Information Services Firm in Stamford, CT. Must have Bach or equiv in Comp Sci or Systms, Elec Engg or Economics & 4 yrs s/ware exp.

Respond by fax to: (203)425-1196, Attn: Maggie

Sr. Data Network Analyst wanted by Online Financial Services & Brokerage Firm in Jersey City, NJ. Must have 3 yrs computer exp.

Respond to: HR Dept, National Discount Brokers Group, Inc., 10 Exchange Place Center, 15th Fl, Jersey City, NJ 07302

Software programmer wanted by jewelry manufacturing co. in New York, NY. Must have Bach degree or equiv in Comp Sci or related field, 2 yrs exp dvlpg, modifying, implementg & maintaing comp s/ware.

Respond to: HR Dept, BH Multi Com Corp, 15 W. 46 St, New York, NY 10036.

ABB

Automation is the world's leading supplier of meters, software and systems, for the electric utility industry. ABB Automation is currently seeking:Software Engineers wanted to design and develop software applications and systems for electric utility companies using C/C++ and Object Oriented design and analysis methodologies. Perform requirements definition, design, implementation, testing, documentation, delivery and post delivery support. Requires a degree and development experience. Competitive pay based on experience. Please send resume to: ABB Electricity Metering, 208 S. Rogers Lane, Raleigh, NC 27610. Attn: Human Resources or Fax: (919) 250-5748, or e-mail to: Raleigh.Staffing @us.abb.com.
Equal Employment Opportunity Employer

SENIOR SOFTWARE ARCHITECT AND DESIGN ENGINEER: Design, develop and implement architecture for a next generation of loop carrier equipment for use in digital telecommunications networks. Develop design specifications for telephone service management system. Provide system-wide design support for performance monitoring and transport mechanism and software stream management. Develop real-time fault-tolerant software to support redundant equipment and facilities maintenenance. Develop software code using object-oriented analysis and design techniques. Use computer-aided software engineering tools. Test system functionality to verify compliance with ISO-9000 standards. Requires a Bachelors degree in Computer Science, Electrical Engineering or Computer Engineering and three years experience in the job offered or three years as a Telecommunications Engineer. Experience must include software development for communication systems/networks using object oriented analysis and design techniques. M-F 8:00- 5:00. $71,000/yr. Interested applicants to apply in person or by resume to: Georgia Department of Labor, Job Order #GA 6521412, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office.

Object Alliance Corporation

Atlanta, GA based company is seeking individuals for career opportunities in software development, software engineering and consulting. Bachelor's and Masters' positions available, with at least one year of experience in various fields such as Java, JSP, ASP, App Servers, Oracle, Sybase, C/C++, Delphi, Powerbuilder, Visual Basic, NT and Solaris/Unix. Salary commensurate with education and experience. Please email resumes to: employment@objectalliance.com.
EOE

Software Developer: Determine & document software & system requirements & design, & develop software using C++ & Visual C++ to interact with SOL Server database. Analyze & design software using object-oriented design tools & methodologies. Architect distributed software using distributed technologies (COM & CORBA). Req: MS in comp. sci., engineering, or a related tech field. Resumes to: S. Mahendrakar, Software Services & Resources Inc 7024 Santafe Pkwy, Atlanta, GA 30350.

COMPUTER PROFESSIONALS

USE OUR HORIZONS TO EXPAND YOURS

Currently, we have openings at client sites in New Jersey & throughout the US for the following IT professionals:

- Programmer Analysts
- Sr. Programmer Analysts
- Systems Analysts
- Sr. Systems Analysts
- Software Engineers
- Database Administrators
- Network Systems Engineers
- COBOL, CICS, DB2
- POWERBUILDER
- VISUAL BASIC
- VISUAL C++
- C/C++/UNIX
- MS/EXCEL • SOL SERVER
- WINDOWS NT
- JAVA/JAVA SCRIPTS
- UNIX • MS/ACCESS
- ORACLE PL/SQL
- SAP R/3, • LAN/WAN
- WEB ARCHITECTS
- WEB DEVELOPERS

with a combination of the following skills:

- COLD FUSION
- SPECTRA
- VISUAL BASIC
- VISUAL C++
- ASP • COM, DCOM
- JSP • HTML
- JAVA, JAVA BEAN
- EJB JAVA SERVLETS
- WEB SPHERE
- BROADVISION
- XML, UML
- NET.COMMERCE

We also have positions open for:

- Project Managers
- Business Analysts
- Systems Analysts

with any of the following skills:

- WEB Development Background
- Object Oriented Design
- CMM Level II
- Foreign Exchange
- Program Office
- Developers

with Vantage Financial Package

We'll provide you with a stimulating supportive environment, attractive salaries and benefits including: Tuition Reimbursement, 401K Savings Plan Company Matched, Life, Health, Dental Plan, On-Going Technical Training and Employee Assistance program. Please forward your resume to: Tom Culmone, Staffing Manager, Dept. 0717, COMPUTER HORIZONS CORP., 49 Old Bloomfield Avenue, Mountain Lakes, New Jersey 07046-1495. Call 973-299-4000 or 1-800-321-2421. Fax: 973-331-1632. E-mail: jobs@computerhorizons.com (in MS Word format only, please) Please visit our website at www.computerhorizons.com Equal Opportunity Employer M/F

Software Development Engineer: Responsible for design and implementation of Routing Table Generator. Participate in the architecture design and responsible for design and implementation of the Ouality of Service Manager Module. Participate in MPLS design and implementation especially in the areas of MPLS configuration and LSP set-ups, teardowns, labeled and unlabeled packet fowarding. Participate in architecture and design of Forward Engine for the edge router. Will write high and lower level software design documents, attend design reviews, write code, attend code inspections, write and review module test plans and perform testing and debugging of communication oriented software. Requires: M.S. in Electrical and/or Computer Engineering and 1 year experience with Commercial Router Product Development. Strong C programming skills. Demonstrated ability developing software using UNIX and Windows. Knowledge of IP routers and switches, C++ and object oriented programming. 40 hrs/wk (9 to 5); $74,750/yr. Send two resumes/responses to Case No. 20000222, Box 8968, Boston, MA 02114.

EXCEPTIONAL OPPORTUNITIES FOR IT PROFESSIONALS

KR Information Technology-a rapidly growing IT consulting company, is looking to expand its team of full time employees at its New York Office. We believe strongly in making an investment-in our people! Our consulting opportunities are career choices, not just contract assignments. The individuals we are currently seeking will possess at least two years professional experience in the following:

UNIX developers with significant C, C++ and JAVA experience, Shell scripting, SQL coding, performance monitoring, fine-tuning, strong communication skills necessary to add new functionality to existing and new systems based on end-user requirements.

ORACLE developers with excellent PL/SOL and Pro C skills, capable of creating of stored procedures, triggers, database objects, indexes-to implement Disaster Recovery/Business Continuation Planning, Replication, Clustering in UNIX/NT. Independent thinking and problem solving critical for success in these visible roles.

KR Info Tech offers full-time positions with Health, dental, and disability insurance, paid vacation, training, 401K and much more.

Send resume to KR Information Technology, Inc, Attn: RajBhator, 215-18 49th Avenue, Bayside Hills, NY 11364.

Systems Consultant (Burlington/Boston, MA): Analyze, design, develop, code, test, implement & install engg automation applns for automotive, industrial & high tech industry. Understand customer manufacturing & design processes, product drawings, business rules, analyze & implement them in the s/w applns. Suggest improved design process. Custom configure industrial products to generate parts in real time, produce various design proposals, mechanical validation, produce manufacturing instructions, perform engg computation, geometric configuration using 3D solid modeling, design components of the product, generate solid model & drawing of the configured product. Generate NC Programs using CAD/CAM s/w such as I-DEAS & Master CAM. Develop GUI, implement product configuration rules using SellingPoint, database manipulation, write AutoLisp programs to customize AutoCAD s/w. Bachelor's in Mechanical Engineering or Computer Science degree may be equivalent w/ 2 yr exp req'd. 40 hrs/wk, 8 am-5pm, $50,000/yr. Pls send 2 copies of resume to Case# 20000884, PO Box #8968, Boston, MA 02114.

Programmer Analyst req. by spec. software dev., & consultancy comp. Duties: Design, develop, maintain and implement large volume on-line and batch-oriented application systems with Data Ware House, Accounting and Loan Processing System. To improve performance and establish interface for portability between mainframes and client server, Work extensively with IBM mainframe and mid-range computer systems using IMS DB, DB2, COBOL, VSAM, SOL, SYBASE, RDBMS and POWER BUILDER. Job to be performed at Norcross, GA and by traveling to various unanticipated client sites in the U.S. as assigned. Requirements: B.S. degree & 18 mths exp. in either Math or Engg. or Sci. or Comp. Sci or 18 mths. in the related occupation as Systems Programmer or Programmer. Salary: $63,000/year. Hours: 8:00 AM to 5:00 PM, 40 Hrs/week. Submit 2 copies of resume to Georgia Dept. of Labor, Gwinnett, Job Order #GA 6525044 – 1535 Atkinson Rd., Lawrenceville, GA 30243-5601 or the nearest Dept. of Labor Field Service Office.

BOSE Corporation, an innovative leader in consumer electronics and acoustics, has an immediate need to fill a range of SAP, EDI, and Sales Systems Support positions in the Boston area. The following positions all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Administration, or similarly relevant field, and 2-6 years relevant experience to include the requirements described below.

PROGRAMMER – ANALYST POSITIONS

- Sap Basis Administrators (with SAP experience, involving both Oracle and HP-UX and protocols, in a production environment.)
- EDI – Sales Systems Support Programmer/Analyst (with EDI mapping and HP-UX scripting experience, in a production environment.)

Starting salaries range from $47,100 to $82,600 per year, together with two weeks annual paid vacation, medical and life insurances, and other industry-competitive benefits.
Please mail or fax your resume to: Mr. Donald Baptiste, (IMSP), Bose Corporation, Dept. 5-D-1, The Mountain, Framingham, MA 01701.
Fax: (508) 766-7499. Email: don_baptiste@bose.com. Visit: www.bose.com.

IT careers.com

SOFTWARE & DATABASE POSITIONS

BROOKS AUTOMATION, INC., a global, public company engaged in the design, development, manufacture and sale of material handling robotic and other hardware and software systems to technology manufacturers, seeks to fill a number of Software Engineer and Database positions at various levels of responsibility at our location in Chelmsford, MA.

All positions require a Bachelor's degree (or equivalent) (some require a Master's degree), together with at least 1 to 7+ years relevant industry experience:

Principal Engineer (Client-Server Mfg. Systems)

- (3-Tiered Client-Server Arch.; OC Design / Dev.; Semiconductor Mfg. Execution Systems)

Senior Software Engineer (Infrastructure)

- (Multibyte Character Set Support; Unicode; Messaging Systems)

Oracle Database Administrator (Data modeling)

- (CASE tools and AIX-UNIX)

Starting salaries from $50,200 - $107,900, commensurate with the position's specific responsibilities, together with contributory medical, full dental and disability insurances, and other industry competitive benefits.

Please mail or fax your resume, indicating Reference Code "IMSP", to: Brooks Automation, Inc., ATTN: Ms. Susan Sacca, Human Resources, 15 Elizabeth Drive, Chelmsford, MA 01824; Fax: 978/262-2508. Visit our website at www.brooks.com.
Brooks Automation is An Equal Opportunity Employer.

Marketing is in New York.
IT is in Philadelphia.
The client is in Austin.

How
do you get all 3 to play together nicely?

Bounce some ideas off your web guru. You'll be surprised.

That's what makes consulting at Omicron different. Sure, we've got the best software and clients. But we also have a methodology where support is all around you and everyone is in the loop. We call it SmartSourcing, but really it's just consulting common sense. Just think how that kind of support could affect your career. The following positions are currently available:

- **e-Commerce Product Manager (#110)**
- **Graphics Web Designer (#107)**
- **Product Architecture (#109)**
- **Project Leader (#102)**
- **Project Manager (#103)**
- **Senior e-Commerce Consultant (#111)**
- **Software Developer (#104)**
- **UNIX Administrator (#112)**

Omicron offers a rich benefits program that includes: 401(k), profit sharing, bonuses, tuition reimbursement and commuter benefits. Please send/fax resume to: Omicron Consulting, Attn: HR – (insert reference code), 1500 Market St., Suite 2300 West, Phila., PA 19102. Fax: (215) 854-0079. E-mail: hr@omicron.com EOE.

OMICRON.
OMICRON CONSULTING
A Company of the PBA Consulting Group

www.omicron.com

SOFTWARE SUPPORT FOR STRATEGY CONSULTING

Decision Architects, a Monitor Group Company, providing customized software solutions in support of strategy consulting, has an immediate need to fill a range of software, database and IT positions in the Boston area.

The following positions all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Administration, or similarly relevant field, and 2-6 years' relevant experience to include the requirements described below.

PROGRAMMER - ANALYST and DATA BASE DESIGN ANALYST POSITIONS

- **Application Development Analyst (Business Systems)** with experience building software-based business analysis models, and a functional understanding of accounting.
- **Data Base Design / Application Consultant** with experience in software development, data base admin/ design, performance-tuning, Oracle Lite and Express, and a functional understanding of financial accounting.

Starting salaries range from $58,500 to $77,500 per year, together with two weeks' paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits.

Please mail or fax resume to: Ms. Ashley Kiersten, Recruitment Manager, Decision Architects, 2 Canal Park, Cambridge, MA 02141. Fax: (617) 761-3677 Email: Hire_Me@decisionarc.com

Visit: www.decisionarc.com

Decision Architects, a Monitor Group Company, is an equal opportunity employer

Architect to manage a team in the research,analysis, design and testing of new and emerging client/server and web-based technologies. Will lead the analysis of new technologies and creation of specification documents and system architecture documents to develop and architect new applications and systems; create user specification document, system architecture document and develop entire architecture of the system by working closely with business users and analyzing the data provided by the business users; identify business entities and relationships between them and supervise the development of data, functional, and object model for the system; articulate and explain system specifications and design to other team members; will supervise and ensure technical quality control. Requirements: Masters Degree in Comp. Sci., Math, Electrical Eng., or Comp. Eng., and two (2) years experience in job offered, or two (2) years experience analyzing and testing new and emerging client/server and web applications, OR a BSc Degree in Comp. Sci., Math, Electrical Eng., or Comp. Eng. and five (5) years of experience analyzing and testing new and emerging client/server and web-based applications. Candidate must also possess demonstrated expertise architecting and developing mission-critical Internet and client/server applications in Unix OR Windows; demonstrated expertise in complex GUI design and development using Visual C++ or Visual Basic in Windows; and demonstrated expertise performing data modeling for large client/server applications using data modeling tools on SQL Server or Oracle databases. Salary; $76K/yr, M-F, 9a-5p. Send 2 resumes to: Case No.19993600, PO Box 8968, Boston, MA 02114. EOE. Applicants must be US workers eligible to accept full-time employment in US.

Senior Account Manager, Atlanta: Prospect, present, close executive-level sales reaching $500K in complex business-to-customer envrmt w/in assigned territory &/or list of target accnts. Direct sales of electronic customer relationship mgmt s/tware products to Fortune 1000 hi-tech accnts/outsource customer support orgs. Advise on business process re-engg; map Primus technology to complex business reqmts; present technical solutions from operations point of view; translate call center metrics into return-on-investment calculations & savings; document proposed systems solutions. Use in-depth knowl of: relational d/base s/ware, architecture/infrastructure of inbound call centers, call tracking systems used in call centers, internet interface to legacy systems, new channels of customer self service (VOIP, email & chat), authoring of solutions to knowledge base, client server applics, infrastructure technologies (call center switches, VRU's). Req: Bach (or foreign equiv, or equiv. in educ or exp, or any combin. of educ &/or exp) in Mktg or Comp Sci or related field, + 5 yr exp. in job offd. or as Sr S/ware Sales Account Mgr w/relational database background & sales reaching $500K. Email resume to lmills@primus.com or mail to Ms Lynda Mills at Primus, 1601 Fifth Ave, Ste 1900, Seattle, WA 98101

Software Engineer wanted by Software Applic Dsgn, Dvlpt, Consulting Co in New York, NY. Must have Associates Degree in Comp Sci, Comp Eng or Math & 2 yrs s/ware exp

Respond to: HR Dept, Financial Technologies Inc., 22 Cortland St, 22nd Fl, New York, NY 10007

Programmer Analyst wanted by S/ware Dsgn & Dvlpt Firm in Rosedale, NY. Must have Bach/equiv in Computer Sci, Busn Admin w/concentration in Info Systems Mgmt & 2 yrs exp analyzing, dsgng & writing codes to dvlp multi-user customized s/ware applics using Fox Pro 2.x for DOS, Clipper Libraries on Novell Netware 3.x platform.

Respond to: HR Dept, Softwize Int'l Inc., 246-14 137th Rd, Rosedale, NY 11422.

Software Engineer
Design, Development, Testing and Implementation of commercial/business application systems. Must have demonstrated ability in Visual Basic; demonstrated ability in design and development of applications using MS-Access; and demonstrated ability working with MS-Windows NT/95, SDK, ODBC, API and C. Req. 2 yrs exp in job offered or 2 yrs exp in Software Development. MS in Computer Science, Math, Engg or related field. Salary is $80,000/yr, 40 hrs/wk, 8:00 to 5:00 p.m. Send two copies of resume to Job Order #19992479, PO Box #8968, Boston, MA 02114.

Software Developer: Design & develop Internet & client server based applications to manage data & generate reports using HTML, CGI Scripting and Crystal Reports, SQL, RDBMS SQL Server, via Visual Basic, Active Server Pages, ADO, ODBC, SQL, PL/SQL & VBA; database (modeling & warehousing) design using S-Designer, ER-Win tools. Req. MS in comp. sci., engineering, or related tech field. Resumes to: S. Mahendrakar, Software Services & Resources Inc, 7024 Santafe Pkwy, Atlanta, GA 30350.

Programmer Analyst wanted by S/ware Dvlpt & Comp Consulting Services Co in Edison, NJ. Must have Bach in Comp Sci & 5 yrs s/ware exp.

Respond to: HR Strategic Professional Services, Inc., 505 Thornall St, Ste 304, Edison, NJ 08837.

Talent is the fuel of the new economy.

Fill up with ITcareers.

IT careers and ITcareers.com can put your message in front of 2/3 of all US IT professionals. If you want to make hires, make your way into our pages. Call Janis Crowley at 1-800-762-2977

IT CAREERS
where the best get better

Progress Programmer (Tappan) develop new software applications or enhance existing ones for manufacturing & distribution modules using progress 4GL; develop reports for all modules, but mainly for accounting; assist end users w/troubleshooting problems on current Progress applications, as well as in windows & Microsoft applications, i.e., word and excel; 40 hrs/wk; 9am-5pm; 4 yr. degree req'd; call (914) 359-9300.

PROGRAMMER ANALYST

with 2 years of industry experience to design and develop software applications. Excellent communications and a Bachelor's degree required.

Fax resume to:
Tina (781)932-0895
or email:
tina.betti@talentpoint.com

Programmer Analyst sought by Full service consulting firm in Miami, FL. Must have Bach in Comp Sci & 2 yrs exp. Respond by resume to: HR 200, Business & Computer Associates, PA. 8780 N.W. 18th Terrace, Miami, FL 33172.

Systems Analyst wanted by Co providing consulting services in database technology in Jersey City, NJ. Must have BS in Comp Sci & 1 yr 6 mos exp administering network infrastructure & servers, installing & managing Oracle Servers & dsgng, dvlpg & supporting client-server & multitier applications.

Respond to: HR Dept, Ishi Systems, Inc., Att: Ajay Mohan One Exchange Place, Ste 308, Jersey City, NJ 07302.

Senior Oracle Data Base Administrator wanted by Marketing Firm in New York, NY. Must have Masters in Comp Engg. Respond to: HR Dept, Promotions.com, 450 Park Ave South, 4th Fl, New York, NY 10016.

Software Engineer wanted by Computer Services Co in Edison, NJ. Must have Masters in Comp Sci, Comp Engg or Elec Engg. Respond to: HR Dept, Horizon Companies, Inc., 2025 Lincoln Highway, Ste 322, Edison, NJ 08817.

Senior Software Engineers (multiple positions) wanted by Texas based Info Technology/Software Consulting Co for job in Wilmington, DE and client loc throughout the US. Must have MS in Engg, Comp Sci or related field.

Respond to: HR Dept, Nile Systems, Inc., 1750 N Collins Blvd, Ste 200, Richardson, TX 75080.

Sr. Hardware Engineer wanted by Co mfg comp components in Marlborough, MA. Must have Masters in Elec Engg, Comp Sci or related discipline.

Respond to: HR Dept, ATI Research Inc., 4 Mount Royal Ave, Marlborough, MA 01752.

Connect with the best!

Network World Career Fair

Atlanta, September 26 - 28

If you're in the market for a new career challenge, make some key connections during the Networld & Interop Conference in Atlanta.

Top employers from across the US will join Network World Magazine in this three-day Job Fair.

September 26 10AM – 6PM
September 27 10AM – 6PM
September 28 10AM – 4PM

NetworkWorld AN IDG COMPANY

IT careers

Programmer Analyst - Sought by Clinton, IA consulting company to work in various unanticipated locations throughout the U.S. Analyze, plan, develop, test and document computer programs. Evaluate user request and software program requirement for new and modified programs. Write specifications, code, test and debug computer programs. Use of IBM AS/400, RGPIV, RPG/400, SQL/400, Ouery Manager, COBOL/400, PDM, RLU, SDA, MS Office, Visio, Lotus Notes and Client Access. Reqs. Bachelor's in Computer Science, Computer Engineering, Mathematics, Physics or its foreign equivalent. Plus 1 year in the job offered or 1 year in a related occupation including Programmer/Programmer Analyst or Software Engineer. $60,000/year, 40/hrs/wk, 8 AM-5PM. Respond by resume to Iowa Workforce Center, 2740 S. 17th Street, Clinton, IA 52732-7040. Refer to Job Order No. 1101068.

Systems Executive. 40hr/wk from 9 a.m. to 5 p.m. $62,000/yr. Consult with clients to ascertain and define their business requirements or problem areas. Analyze, design, develop and implement computer software for clients' MIS Systems. Analyze user requirements and applications. Design applications and databases. Develop program specifications and computer programs. Unit and System testing. Technical support. Work is done on IBM 3090 based systems using VS COBOL II, COBOL 370, DB2, CICS, TSO, ISPF, JCL, OMF, SPUFI, FILEAID and XPEDITOR. Require M.S. degree with Computer Science or Engineering (Systems and Information) as major with two years experience in job offered or as Systems Analyst with two years experience with the computer hardware and software described above. Applicants must show proof of legal authority to work in the U.S. Northwest suburb. Send resume to Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, Illinois 60605, Attention: Brenda Kelly Reference #V-IL23093-K An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter.

NEED TO HIRE. START WITH US.

ITcareers and ITcareers.com reach more than 2/3 of all US IT workers every week. If you need to hire top talent, start by hiring us.

Call your ITcareers Sales Representative or Janis Crowley at 1-800-762-2977.

IT CAREERS
where the best get better

ITcareers.com

SOFTWARE ENGINEER

Designs, develops and implements database applications in the UNIX environment. Researches and applies state-of-the-art development methods to the solution of user requirements. Uses and applies thorough understanding of business systems, business requirements and user needs as well as Oracle 7.x/ 8.x databases, Oracle Forms and Reports, PL/SQL, C++ and C. Documents user requirements, schedules and coordinates projects, and supports installation of software systems. Requirements: M.S. in Computer Science plus two years experience as a software engineer of database applications including use of Oracle, UNIX (Solaris 2.x) and Windows NT 4.0 operating systems. $30 to 35/hr., 40 hr./wk. Qualified U.S. workers are encouraged to apply for this position. Send two copies of resume to M. Brooks: DWE-ALC; P.O. Box 7972; Madison, WI 53707-7972 and reference case number C101625 on the application materials. EMPLOYER PAID AD.

Software Engineer - Sought by Springfield, IL consulting company to work in Clinton, IA. Research, design and develop computer software systems in conjunction with hardware product development. Consult with clients. Analyze, plan, develop, test and document computer programs including business programs. Evaluate user requests and software program requirements for new and modified programs. Write specifications, code, test and debug computer programs. Customize hardware and software to client needs. Use of UNIX, Visual Basic, MS Access, HTML, Java, and Shell Scripting. Reqs. Master's in Computer Science, Computer Engineering (any field), Business Administration or its foreign equivalent. Plus 1 year in the job offered or 1 year in a related occupation including Systems Analyst or Programmer Analyst. $55,000/year, 40/hrs/wk, 8 AM-5PM. Respond by resume to Iowa Workforce Center, 2740 S. 17th Street, Clinton, IA 52732-7040. Refer to Job Order No. 1101067.

Programmer Analyst needed for software development and consulting firm located in Duluth, Georgia. Job duties include: Analyze, design, develop, test and implement computer software applications. Consult on various in-house projects and/or contract basis throughout the United States. Use RPG/400, CL/400, SOL/400, PDM, SEU, SDA, RLU, and DFU on IBM AS/400 machine. Applicant must have 2 yrs. exp. in the job duties listed above or as a programmer, programmer analyst or consultant which includes designing and developing software applications using RPG/400, CL/400, and SOL/400 on IBM AS/400 machine. 40 hrs/wk., 8am - 5pm, Mon-Fri. $59,775/yr. Apply in person or send 2 resumes to: Georgia Department of Labor, Gwinnett, Job Order #GA 6525399 1535 Atkinson Road, Lawrenceville, GA 30043-5601 or the nearest Department of Labor Field Service Office.

Full time Senior Consultant to design, develop, install and test custom software business systems utilizing C, Delphi, OS-DOS, OS/400, VM, MVS, OS/2. Must have a Bachelor's Degree in CS or related field or foreign degree equivalent. Must have one year of experience in job offered or position with same duties. Salary $72,000. Send resume to: Steve Denton IStream, Inc. 3103 Bee Caves Road, Suite 105, Austin, Texas 78746.

Project Manager
(Multiple Positions: 5)

Monday through Friday; 8 a.m. to 5 p.m.; $ 61,000 annually. Required is a Bachelor of Science Degree or equivalent in Engineering, Computer Science or Math. In lieu of a formally awarded baccalaureate degree, employer will accept a combination of computer-related courses and seminars in conjunction with three (3) years of computer-related work experience substituted for each year of formal academic education lacking. Also required are three (3) years of experience in the job offered or three (3) years of related experience as a Business Analyst, Programmer/Analyst, and/or Systems Analyst. Related experience presupposes one (1) year of project management experience for computer systems projects within a financial or insurance environment. Leads a team of project leads, system analysts and programmers, networking and database professional involved in projects associated with the design and implementation of commercial information technology (IT) applications for financial institutions, insurance and manufacturing integrated automated data processing functions. Consults with internal and external users to resolve issues, builds strong relationships with users/clients, budgets, reports status, and negotiates change requests. Review requirements and high level design to evaluate effectiveness of solution in meeting the users/clients needs. Plans, directs, and coordinates activities according to the SEI's Capability Maturity Model (CMM). Creates Project Definition Book which defines the scope, objective, and constraints of the project. Defines project management details such as issues and defect tracking, change management processes, and review & sign-off processes. Creates the work plan for each phase of the development life-cycle, selects and schedules team members and leads team by assigning duties, responsibilities, and scope of authority to team members. Utilizes COBOL, COBOL II, IMS DB/DC, DL1, DB2, SOL, VB 5.0, Btrieve, PL1, SUPRA on large scale mainframes utilizing MVS operating systems and Client Server, NOVELL, and UNIX platforms. Utilizes project management tools that include MS Project, MS Word, MS Excel, and e-mail for documenting, budgeting, communicating, and tracking. Must have proof of legal authority to work permanently in the United States. Interested applicants submit two (2) resumes with reference to cases C101609 & C101610 to: Mike Brooks, DWE-ALC, P.O. Box 7972, Madison, WI 53707-7972.

Cybersoft Technologies, Inc.

Cybersoft Technologies, Inc., is a software consulting company providing solutions on a wide range of applications from desktop to enterprise level. We are looking for the following positions:

Software Engineeers (Main Frame):

This position involves research, analysis, design & development of Mainframe and/or Multi-tier Architecture enterprise level systems. Knowledge of Database Design with expertise in implementing enterprise level Data Warehouse & Data Mart's. Some experience in Data Modelling & Legacy System conversion is preferred. Requires Masters degree in Computer Science or equivalent and 1 + year's experience.

Software Engineers (Java)

This position involves research, analysis, design, and development of Internet programs for Web-based knowledge management, customer relationship Management, sales force automation, and e-commerce. Knowledge in Java and HTML programming is preferred. Requires Masters in Computer Science OR equivalent and 1 + year's experience.

Programmer Analyst:

This position involves planning, developing, testing and documenting Internet based programs. Need to develop Java based software programs. Requires Bachelor's degree in Computer Science or equivalent and 1 + years Experience.

Send your resume to Cybersoft Technologies, Inc., 4420 FM 1960 West, Suite# 222, Houston, Texas 77068. informaster@cybersoftech.com Fax (281)895-9555.

Consultant (Technical)

Consult with client users and management personnel to determine technical requirements, define problems, and implement solutions. Design, customize, implement, and tune large Oracle databases and database applications. Convert data from legacy to Oracle based graphical user interface (GUI) applications. Develop data models and modify applications to conform to new requirements.

Master's degree or equivalent in Comp. Sci. or related field (Comp. Eng; Comp. Appl.; CIS; MIS), Math or Eng., plus three years software development experience, or a Bachelor's degree equivalent in same fields of study, plus five years of progressive software development experience. Must have working knowledge of Oracle GUI database applications.

$75,000/yr., full time, 8:00 a.m. – 5:00 p.m.

Work in the Denver Area. Application is by resume only. Submit resumes to: Colorado Department of Labor and Employment, Employment Programs, Attn: Jim Shimada, Ref# CO 4665863, Two Park Central, Suite 400 1515 Arapahoe Street, Denver, CO 80202.2117

Multiple IT Positions
(St. Louis, MO)

Software Engineers and/or Programmer-Analysts
· AS/400,Cobol- Design/testing/maintaining applications utilizing AS/400 CL/400, Cobol/400, DB2/400.Evaluate systems effectiveness, recommend improvements, trouble shoot problems in programming and other project specifications.
· Java Developers- Develop/test/maintain C++, Java, Oracle applications focusing on sever aspect of Web develop. Will use Java and Oracle with any two of the following skills: C++, Java servlets, Enterprise Java Beans, weblogic or websphere with visual age, ASP, Java Script, and HTML 4.0.
Data Base Administrators- Prepare/maintain physical and logical design of Oracle db structure and parameters. Install/maintain Oracle relational db mgnt system, load data, perform tuning, test backup procedures and determine data recovery strategies. Use Oracle RDBMS, SOL and other tools.
Requirements on Edu/Exp: For Software Engr. and DBA: M.S. in Comp Sci.or the equivalent w/ min. 1yr. exp.(also accept BS w/ at least 5 yrs exp.) For Programmer-Analysts, BS w/ 1-3 yrs experience. Competitive salary/ EOE. Resume to Rao V.,TechnoSmarts, Inc., 968 Crown Pointe Estates Dr. St.Louis, MO 63021.

IT careers.com

INTERONE MARKETING GROUP

INTERESTED?

CHIEF INFORMATION OFFICER

InterOne Morketing Group is one of the notion's lorgest speciolized morketing communicotions componies ond is o member of the BBDO Worldwide Network. Currently, we are seorching for a CIO with the enthusiosm, credibility, ond fortitude to provide compony-wide leodership thot will enoble us to exceed client requirements.

The ideol condidote will be copoble of developing and mointoining effective relotionships between IT ond oll business oreos, ossisting key monogement in moximizing opportunities and improving quolity/efficiency, mointoining ond enhoncing needed systems, ond investing in the education/troining of InterOne humon copitol.

In on environment thot fosters professionol growth, we provide ottroctive solories ond o comprehensive benefits progrom. For confidentiol considerotion, pleose forword your resume to:

InterOne Marketing Group
ATTN: Debra Coffey-CIO
880 West Long Lake
Troy, MI 48098-4504
Email: debra.coffey@interonemarketing.com

AN AGENCY OF THE BBDO WORLDWIDE NETWORK
Equal Opportunity Non-Discriminatory Employer

International Software Consulting, Inc.

International Software Consulting, Inc. is a software consulting firm providing contract services in software development, custom coding, software support and maintenance. Our expertise ranges in the fields of client/server projects to legacy and UNIX systems. We are looking for the following positions in the web development field.
Software Engineers:
This position involves research, analysis, design, and development of Internet programs for Web-based knowledge management, customer relationship management, sales force automation, and e-commerce, Knowledge in Java or C++ and HTML programming is preferred. Requires Masters degree in Computer Science or equivalent with 1 +year's experience.
System Analysts:
This position involves planning, developing, testing, and documenting Internet based programs. Need to develop JAVA or C++ and CORBA based software programs on Microsoft or UNIX environment. Requires Bachelor's degree in Computer Science or related with 1+ years experience.
Programmer Analysts:
This position involves planning, developing, testing, and documenting Web enabling of legacy systems. Need to develop DB2, COBOL, CICS, Java or C++ software programs on Microsoft or UNIX environment. Requires Bachelor's degree in Computer Science or related with 1+ years work experience in USA.
Send your resume to international Software Consulting, Inc., 2825, Wilcrest Dr. #270, Houston, Texas 77042. Fax (713)981-9522. E-mail: ramag@iscincorp.com

Trusted by more hiring managers than any IT space in the world.

IT careers.com

Analyst

"Are You On The Webb"

Webb Information Services LLC. Is a Information Technology Professional Services firm with offices in Minneapolis, Phoenix, Orlando and Fargo. Webb Information Services specializes in developing, implementing and Integrating Client Server based applications such as ecommerce, CRM, Business Intelligence and ERP Software. We currently have the following exciting opportunities available.

Architect
We are seeking individuals with Internet and/or Application architecture experience. Object oriented client server background desired.

Java Developers
We have outstanding career opportunities within our Sun Certified Java Practice Group. Java, EJB, Servlet and JSP experience preferred. Experience with (RUP) Rational Unified Process a plus.

Clarify Programmers/Business Analysts
We are seeking top professionals with either Clarify development experience or Business Analysis experience with Windows platform preferably.

Applications Development
Currently we have opportunities in our Windows application group for developers with the following experience, C++, Visual Basic, Visual Interdev, ASP, SQL, and NT.

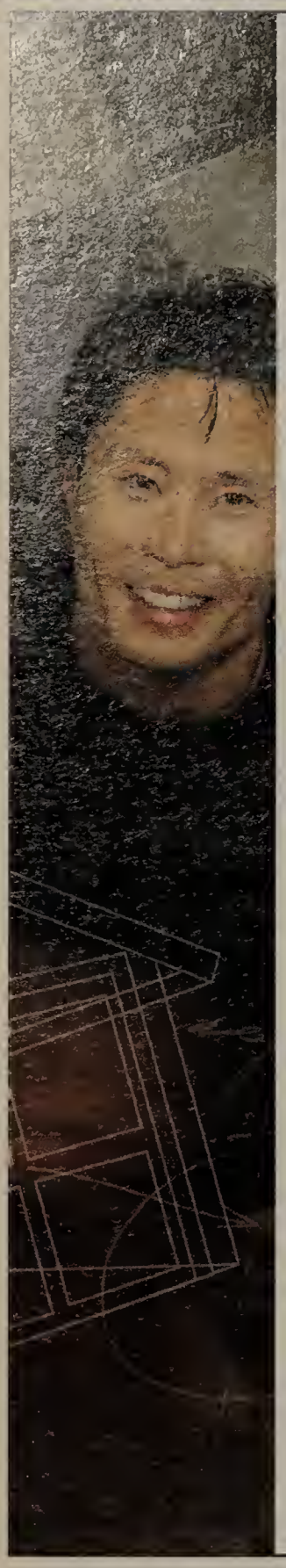
Microstrategy Professionals
Join our exciting and gratifying Microstrategy/Business Intelligence Practice as we are seeking both functional and technical professionals with Microstrategy experience.

Webb Information Services, LLC
11000 Prairie Lakes Drive, Suite #410
Eden Prairie, MN 55344
952-918-3662 or fax 952-918-3625
Email vern@webb-is.com

PROGRAMMER/ANALYST. Convert customer requirements into program specifications; analyze impact of proposed solutions on business applications; test, analyze, and correct deficiencies according to customer requirements; review work done by development team members. Must have Bachelor's degree in Computer Science or related, plus two years experience. Must have knowledge of Visual Basic, C, Unix, Oracle Database Design, Oracle PL/SOL, and Oracle ProC pre-compiler. Job located in Cedar Rapids, IA. Send resumes to APAC Customer Services, 6 Parkway North Center, Deerfield, IL 60015.

Software Consultant sought by Computer S/ware Consulting Co. in Chicago, IL. Must have 1 yr exp using VB, MS Access, Borland Delphi, PL/SOL, Transact/SOL, UNIX, Win NT, Sybase, Oracle and Access. BS in Comp Sci req'd.

Respond to: Solutions Provider, Inc, 10 S. La Salle St. Ste 3310 Chicago, IL 60603



What about your ideas?

Do they keep you up at night? Once you fall asleep do they became your dreams? When you wake up, are they then action items? Ideas mean the world to us at hp. A diversity of ideas means even more. Invent the new hp. Join us.

The following positions are available in Roseville, CA and Ft. Collins, CO:

SW TEST ENGINEERS

Must have experience in system test and/or QA; working knowledge of C/C++, PERL, JAVA and/or shell programming; and experience with automation of manual tests.

SW DEVELOPMENT ENGINEERS

Must have experience developing commercial software for Unix (HP-UX or Solaris) or NT platforms; 2+ years experience in C/C++ development; demonstrated ability to effectively isolate, debug and repair software defects; familiarity with object-oriented and distributed systems concepts; and a Bachelor's degree in Computer Science or related field.

SOFTWARE INSTALL/BUILD ENGINEERS

Must have a Bachelor's degree in Computer Science or related field; 1+ year's experience with software development or software process engineering in UNIX or Windows environment; working knowledge of current programming language such as C, C++, Visual Basic &/or Java; proficiency with script development (ksh, PERL, CGI, etc.);and familiarity with software configuration management and software engineering lifecycle.

NETWORK SPECIALISTS

Must have 3+ years' experience with design, implementation, performance tuning and/or troubleshooting of multi platform, multi-protocol networks; working knowledge of network management platforms; and familiarity with both UNIX and NT environment.

CUSTOMER INTERFACE/PRODUCT TROUBLE SHOOTING ENGINEERS

Must have strong familiarity with Unix and C++ or Java; proficiency with script development (ksh, PERL, CGI, etc.); familiarity with software configuration management

LEARNING PRODUCTS ENGINEER

Must have a Bachelor's degree in Computer Science, Electrical Engineering or related field with significant Computer Science course work, or equivalent education/experience and an understanding of application developer needs.

The following position is available in Atlanta, GA:

Response Center Professional

Must have a bachelor's degree or equivalent combination of education and experience in Computer Science, Math, EE, or related field; 3+ years' relevant industry experience; solid understanding of Unix and/or NT networking and system management; the demonstrated ability to solve complex problems and identify, verify, and document software problems; good understanding of HP's OpenView Network and System Management software or similar products.

HP offers competitive compensation and excellent benefits, including profit sharing, stock purchases, 401 (k) and a retirement plan. For consideration, please e-mail, mail or fax your resume with cover letter including salary expectation and Event# 8603 to: jeff_watt2@hp.com (for positions is Roseville/Atlanta) e-mail to: audrey_bower@nonhp-am.exch.hp.com (for positions in Fort Collins); Mail: Attn: Jeff Watt, 8000 Foothills Blvd, Roseville, CA 95747-5731 MS 5723; FAX: 916 785-1264, Attn: Jeff Watt.

hp invent

hp is an equal opportunity employer dedicated to affirmative action and work force diversity.

Why have 520 people joined Netigy in the last six months?

We've got a pretty simple goal in mind:

become the world's next great global professional service organization. Presumptuous? Hardly.

Not when you look at our place in the new economy.

We're the premier architect of eBusiness infrastructure.

The Fortune 500 are turning to us to create reliable, secure, and scalable eBusiness infrastructures. So we're hiring talent, but only the best. If you answer to that description, bring your brains and your vision to Netigy. You can start to dazzle the biggest, most interesting companies on the globe. Today.

For more information please apply online at:

www.careers.netigy.com

Netigy

Driving eBusiness Performance

EOE

SCS America (BrightStar) is searching for SAP analysts with the following requirements: SAP experience in FI, CO, AM, PS, HR, SD, MM, WM, PP, QM, SM, Basis or Abap/4. Also looking for Business Analysts and J.D. Edwards Functional Consultants. Positions available throughout the U.S. Extensive travel and possible relocation involved. Send resumes to: BrightStar IT Group, 950 Tower Lane, Suite #1750, Foster City, CA 94404 or e-mail to: resumes@brightstar.com

---

Software Jobs (Consultants): Various places in U.S. SW Engr, Prog/Analyst, DBA, User Supp, Supv etc. Pay DOE. Send copy of this ad + your resume w/salary reqs, job interests to: Geosoft Infotek, 295-89th St. Ste. 305, Daly City, CA 94015 or email: sudhir@cilgroup.com.

National Cement Company is looking for qualified candidates for Systems Analyst/Senior Systems Analysts in a dynamic Information Technology/Enterprise Resource Planning Environment. MS/BS or equivalent degree in engineering, computer science or related or relevant work experience. Work with J.D. Edwards's One World, SQL Server, C, C++ and Windows NT. Knowledge of Data Communications will be given first preference. Fax resume to HR Dept (818) 728-0615.

Sr. Software Engineer sought by computer software consulting company in Greenwood Village, CO, to work in Denver, CO & other unanticipated job sites in the U.S., to, at a senior level, design & develop client/server & web-based software applications that interface with ORACLE relational database management systems & run on UNIX &/or Windows NT operating systems & on the web. Analyze requirements. Create designs & design documentation. Code, test, & debug the software application. Use C, C++, Perl scripting language, Pro*C, JAVA Script, & HTML in the design & development process. Engage in project management as required. Requires Master's or equivalent in Computer Science or related field. Specifically, the position requires a Master's, or foreign degree equivalent, plus 3 yrs of progressively more responsible software experience, or a Bachelor's, or foreign degree equivalent, plus 5 yrs of progressively more responsible software experience. Working knowledge of ORACLE, C++, & Perl scripting language. $70,000/yr; M-F; 8am-5pm. (3 openings.) Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400. 1515 Arapahoe St., Denver CO 80202, & refer to Job Order No. CO4666347.

Senior Software Engineer (Boulder, CO) -Specify, design, develop, and implement algorithm based and object oriented software system components utilizing algorithms, C, C++ design and coding skills, Windows, Windows NT and UNIX environments. Must have Bachelor's degree or foreign degree equivalent in Computer Science, Engineering or related field and 3 years experience in job offered or 3 years experience in software development position with same duties as job offered. Salary $90,000/year. Must have proof of legal authority to work in the U.S. Submit resume to Colorado Dept. of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Ste 400, 1515 Arapahoe Street, Denver, CO 80202-2117, and refer to Job Order No. CO4665979.

Great Career Opportunity in Sales Offered By CSB-SYSTEM, International Developers and Manufacturers of Processing Software

CSB-SYSTEM, international developers and manufacturers of $100,000+ enterprise-wide, fully integrated Business Software (ERP) for the food manufacturing industry has exciting career oppurtunities in sales management. Offering pre-qualified sales leads, base, incentive, benefits and extensive training. If you have 5 plus years selling complicated, enterprise-wide software to executive-level decision makers please forward your up-to-date resumes to connie@phasales.com. Please visit our Web Site csb-system.com for complete information. Resumes received in complete confidence.

Senior Applications Consultant. 2 pos. Charlotte, NC & various unanticipated loc in US. Analyze s/ware reqmts & performance reqmts to determine feasibility of dsgn w/in time & cost constraints. Dsgn. Admin & modeling of s/ware systm. Dvlp bus s/ware applics & direct testing procedures. Envrmt: AS/400, RPG/400, Cobol/400 & CL/400. MS Comp Sci/Engg w/3yrs exp or BS w/5yrs exp in job offd or related occupation (Prgmr Analyst, Systms Engr). Must have 1 yr supervisory exp & 1 yr exp on VSAM, IDMS, ADS/O, DB2 & CICS on IBM Mainframe. 40 hr/wk. $90K/yr. Application by resume to CO Dept of Labor & Employment, Attn: Jim Shimada, Tower 2, Ste 400, 1515 Arapahoe St, Denver, CO 80202-2117, ref to JO# CO4666138.

Software Engineer wanted by Co dvlpg & mktg s/ware prgmgs in Fremont, CA. Must have Bach in Comp Sci or Engg & 3 yrs s/ware exp.

Respond to: ArcSoft, Inc., 46601 Fremont Blvd., Fremont, CA 94538.

Engineers and Programmers needed. Several senior and entry level positions available for qualified candidates possessing MS/BS or equivalent and relevant work experience. Work with some of the following: Visual FoxPro, Visual Basic, AS400, SQL and Oracle. Must be willing to travel and relocate as required. Fax resume to 707-746-1620.

ITCAREERS
where the best get better
IT careers.com

WE DO A BETTER JOB AT HELPING YOU GET ONE.

IT careers.com

Talent is the fuel of the new economy.

Fill up with ITcareers.

ITcareers and ITcareers.com can put your message in front of 2/3 of all US IT professionals. If you want to make hires, make your way into our pages. Call Janis Crowley at 1-800-762-2977

ITCAREERS
where the best get better

CHICO'S Casual Clothing

Sr. Web Analyst

Chico's is a fast-growing, national women's specialty retailer based in Ft. Myers, FL. We are looking for a professional to join our MIS team. We require experience with SQL Server, IIS, ASP and site server. HTML and JavaScript are definite pluses. Responsibilities include all back end web site functionality and some web page maintenance.

We offer an excellent working environment and a full benefits package. Send resume or apply in person to: Chico's FAS, Inc., 11215 Metro Parkway, Fort Myers, FL 33912, Attn: Human Resources, Fax: 941-277-7035. No telephone calls, please. EOE, M/F/D

Senior Consultant: Consult with client to define need or problem, and analyze data to determine or recommend business solution; specify user requirements; define functional architecture of system or application; select methods and tools for functional design; plan and control system designers7; work; ensure specification consistency; design, develop, and implement client server software applications using C, Powerbuilder, Sybase, MS-SQ: Server, LBMS Systems Engineer, Erwin, and PERFORMance and Ingres in UNIX and Window environments.
Bachelor's degree in computer science required. Six (6) months of experience in the position or six (6) months as a systems analyst required. Related occupation must include experience designing and developing client-server software applications using C, :BMS, Systems Engineer, Erwin, and Ingres in UNIX & Window environments. 40 hrs./wk.; 9:00 a.m. 1; 5:00p.m.; $70,000/year. Must have proof of legal authority to work permanently in the U.S. Send resume (in duplicate) to: Georgia Department of Labor, Job Order #GA 6519646, 2943 N. Druid Hills Rd. Atlanta, Ga 30329 (or nearest Department of Labor Field Service Office). NO CALLS. AN EMPLOYER PAID AD.

---

e-lite companies

e-merging companies

e-ssential companies

e-normous opportunities

IT careers.com
where the best get better
1-800-762-2977

Computer/Info Systems

Fisher Hamilton L.L.C., the largest manufacturer of laboratory furniture, has an immediate opening for:

DIRECTOR MANAGEMENT INFORMATION SYSTEMS

Your success managing multiple locations and overseeing a technical staff will involve providing access to data, troubleshooting network issues, supervising workflow, evaluating information technologies and providing technical support. You'll also negotiate contracts, obtain project resources, purchase software, assist users and track industry trends.

To qualify, we require a Bachelor's degree in Management Information Systems or Computer Science (or the equivalent) and 5-7+ years in systems analysis, project leadership, information services and technical support. Supervisory background is essential. Desired skills include familiarity with Windows NT, PC networking, AutoCad, AS/400 hardware and software (including RPG), web page design and management, and telecommunications infrastructure. Strong communication, interpersonal, and project management skills are a must.

Along with challenging assignments, we offer relocation assistance, competitive pay, exceptional growth potential and comprehensive benefits¾including medical/prescription drugs/life/dental insurance, 401(k), profit sharing and retirement pension as well as paid holiday and vacation time off. Send your resume and salary requirements to: Fisher Hamilton L.L.C., Human Resources-Dept. RPK, 1316 18th Street, P.O. Box 137, Two Rivers, WI 54241. Please visit our website at: www.fisherhamilton.com. EOE M/F/V/D

Fisher Hamilton

Envision Your Best™ Future

Revolutionizing the IT Staffing Industry globally is what Best@IT Inc. is all about! Founded in London as Best International Group PLC, our American subsidiary - Best@IT Inc. (known in Seattle, WA as BesTech Inc.) has become one of the fastest-growing IT staffing companies in the world!

Since its incorporation on August 12, 1998, Best@IT Inc. has expanded into 5 regional offices providing IT contract and permanent staffing solutions to Fortune 1000 companies throughout the United States.

We currently have immediate openings for our New York/New Jersey, Dallas, Los Angeles and Seattle offices and for projects at a variety of other locations nationwide.

We seek IT professionals with a minimum of 2 years experience in any of the listed areas:

WEB ARCHITECTS & WEB SITE DEVELOPERS

CLIENT SERVER SYSTEMS DEVELOPERS

OBJECT ORIENTED SYSTEMS DEVELOPERS

NETWORK ENGINEERS & NETWORK ADMINISTRATORS

DATABASE ARCHITECTS & DATABASE ADMINISTRATORS

ENTERPRISE RESOURCE PLANNING (SAP, PEOPLESOFT, ORACLE) CONSULTANTS & TEAM LEADERS

Best@IT Inc. offers a dynamic work environment along with competitive salaries and benefit package including paid time off, health/dental insurance, flexible spending accounts and 401(k) with match. For consideration submit your resume to your city of preference from the list below. For projects in other locations submit your resume along with location preference, to bestjobs@best-people.net:

dallasjobs@best-people.net	fax: 972-789-0165	ph: 1-800-660-1613
losangelesjobs@best-people.net	fax: 310-379-5712	ph: 1-877-488-7237
* seattlejobs@best-people.net	fax: 206-505-7905	ph: 1-888-557-5099
newyorkjobs@best-people.net	fax: 212-461-2202	ph: 1-212-461-2200

www.bestatit.net

Best. @IT

*Doing business in Seattle as BesTech Inc.

Best@IT Inc. is an equal opportunity employer.

It's Fast.

It's Huge.

It Crosses Worlds & Dimensions.

IT CAREERS

REAL-TIME FINANCING SOLUTIONS FOR e-COMMERCE

SOFTWARE ENGINEER

SENIOR SOFTWARE ENGINEER

We seek talent at all levels, and require a minimum of a Bachelor's or Master's degree in the appropriate field of study, plus 0-5 years of industry experience. For details please see our website ***(www.ecredit.com)***.

We also have the following management/director level positions available:

DIRECTOR OF FINANCIAL ENGINEERING

MANAGER OF BUSINESS DEVELOPMENT

SENIOR DIRECTOR OF WORLDWIDE PARTNERSHIPS

We are an equal opportunity employer offering excellent compensation and benefits. Please send resume to: Human Resources
eCredit.com, Inc., 20 Carematrix Drive, Dedham, MA 02026
Fax: 781-752-1600,
Email: hr@ecredit.com
EOE

www.eCredit.com

eCredit.com

CHIEF PROGRAMMER/
Object-Oriented Investment Software

COMPUTER AIDED DECISIONS, INC., a small Boston-area company engaged in the design and development of sophisticated software-based investment systems, has a need to fill a **Chief Programmer / Object-Oriented Investment Software** position. This position will be responsible for managing in-house and contract software teams developing highly sophisticated, large-scale applications for portfolio management, trading, and investment research.

- Requirements include a Bachelor's degree in C/S or other quantitative / engineering field, and five (5) years experience involving object-oriented software development, inclusive of large-scale development for investment applications.

- Starting salary ranges from $90,000 - $110,000, three weeks paid vacation, medical insurance, and other industry competitive benefits.

Respond with resume only to: Ms. Pam Tapia, Computer Aided Decisions, Inc., 21 Custom House Street, Boston, MA 02110. Fax: (617) 428-3606. An EOE-MFDV.

The Starting Point of a Great Career!

Best@IT—a world leader in the IT Staffing Industry— has been contracted by NORTEL NETWORKS to train and hire individuals to become Nortel Networks Certified Support Specialists. You will be trained on a variety of products produced by Nortel Networks, including the Passport 7000 and 15000 switches.

Upon meeting certain educational/work criteria, you will be enrolled in our "NO-COST, INTENSIVE, ALL EXPENSES PAID TRAINING CERTIFICATION PROGRAM" at our Dallas, TX Training Center. Successful candidates who satisfy all other Nortel Networks hiring criteria will be eligible for a career with Nortel Networks.

Best@IT & Nortel Networks Have Come Together to Change the Face of Network Engineering

To be eligible for our no-cost program you must possess either:

Minimum 1 year of professional work experience in WAN Networks or Telecommunications. Must be knowledgeable in:

- ◆ TCP/IP
- ◆ OSI/WAN Protocols
- ◆ Routing
- ◆ Telecommunications
- ◆ VOIP

OR

At least 6 months' experience with any Nortel Passport switch

300 positions are currently available in most major metro areas. Positions involve a mix of telecommuting and 60% travel.

Best in Network Engineering
5050 Quorum Drive • Suite 700 • Dallas, TX 75240
Tel: 972 663 0565 • Fax 972 663 0566
E-mail: networkjobs@best-people.net
www.bestatit.net

Best. @IT

NEED TO HIRE.
IT careers.com
START WITH US.

For High Tech Jobs go to www.dice.com

dice.com
High tech jobs online

NASDAQ: EWBX AN EARTHWEB SERVICE

IT Careers in Consulting

There was a time when information technology consulting was just that – what kind of mainframe to buy, install it and provide basic training. Other firms provided staff augmentation, hiring out project managers and IT expertise for "engagements." Today, IT consulting is a mix of complexities focused primarily on resolving business issues and challenges, and only afterward do 21st century consultants apply technology to resolve the issues.

Just as the requirements from clients have changed, so too have the requirements of the consultants. Successful firms are offering employees a chance to choose assignments, to work closer to home and to achieve a better balance between work and personal life.

Ajilon LLC
Conshohocken, PA

With approximately 5,000 consultants located around the globe, Ajilon LLC has developed the ability to cater to multiple markets, multiple industries and multiple business issues. "We deliver services to locations worldwide and assist our clients with solutions for implementation through systems transformation and functional outsourcing," explains Evelyn Meltzer, senior technical recruiting manager for Ajilon. This expansive range of technology services means that Ajilon can address legacy system requirements and provide tools and methodologies to solve business problems.

The problem-solving capability is the biggest challenge, but also the greatest opportunity for Ajilon to bring value to its clients. "We also have clients who want the entire service – functional outsourcing, systems transformation, application development, maintenance and ongoing support," Meltzer says. The company currently is looking for employees with a wide variety of skills, such as client/server developers, project managers, web developers, Internet specialists, network administrators, desktop support and more.

"When I look at a resume, I look for the type and duration of assignments and employment history," Meltzer says. "These are factors that are important to my overall evaluation of the candidate. We are looking for people who enjoy the diversity of consulting, the flexibility of moving from client to client without changing employers, and who have demonstrated an interest in expanding their own capabilities."

Ajilon is concerned with its consultants' career growth. There is an ongoing process for keeping in touch with what consultants need, what they are looking for in the future and how Ajilon can help them reach their goals. "We hire consultants whose characteristics are consistent with those of Ajilon: talented, committed and motivated to succeed in a competitive environment," says Meltzer. Ajilon offers a wide range of benefits to its employees, including medical, dental, vision, retirement plan, life insurance, disability coverage and tuition reimbursement of $2,500 per year.

"We have found that most people who come to work at Ajilon stay here," Meltzer adds. "Our rapid growth exemplifies the qualify of our IT professionals. Ajilon has consultants in more than 80 cities in the United States, as well as Canada, the United Kingdom and Australia. Consultants are assigned within the area where they are hired.

Andersen Consulting
Washington, DC

The big five consulting firms have long been known as the training ground for the industry's leaders. However, Andersen Consulting set about reinventing itself to attract and keep the best consultants anywhere. Where the companies in the past focused on strategic planning and market growth, today Andersen Consulting has reinvented itself to be a leader in e-commerce strategy and implementation for clients.

Among the fastest-growing areas of Andersen Consulting are its 24 dot-com launch centers around the world. These centers are unique, post-incubation e-business studios designed to dramatically reduce the time it takes an initially funded start-up to achieve sustainable success. Andersen Consulting has already worked with more than 350 dot-com start-ups and spin-offs. "Andersen

IT Careers in Consulting

Consulting offers the best of both worlds, meaning the opportunity to work in this fast-paced, very volatile market of dot-coms while still being able to take advantage of the global reach and security of such an established firm as Andersen Consulting," explains Angel Harmon, U.S. director of recruiting for government and global market operations.

A second change made at Andersen Consulting is providing employees with a stake in the firm. "We are investing $200 million in e-commerce-related companies on behalf of our employees through AC Ventures, the firm's venture capital unit, and intend to subsequently continue to invest another $100 million each year," explains Harmon. "The wealth created by these investments will be distributed to employees as 'Eunits' (employee units) – a unique and proprietary form of compensation that harnesses the value of the electronic economy. The company also redefined its partnership program and plans to double the number of partners this year. The idea is to make this level accessible to employees much earlier in their careers."

In addition, Andersen invested $1.3 billion in training, research and development in 1999, a level Harmon expects to continue to grow as the company continues to grow. "We work directly with our employees to identify training goals and appropriate programs. The result is that we can offer the best of both worlds – a wide breadth of career opportunities with both top established companies, as well as with start-ups and spin-offs" says Harmon.

"We are looking for people with e-commerce skills who also have experience in the consulting field," adds Harmon. "That experience might be in front-end operation, middleware, as application developers or as system architects." Andersen Consulting works in five major industries. These include government, resources, financial services, communication and high technology and products. Andersen Consulting is hiring in almost every worldwide location, including more than 40 offices in the United States.

Best@IT Inc.
Freehold, NJ

Raymond Arello, CEO at Best@IT Inc., looks at the information technology arena and notes one statistic that towers above all others: 844,000 open jobs. "At Best, we have the ability to meet staffing needs with talent from a global marketplace," says Arello. "Our role as part of our parent company, Best International Group (of the UK), is to provide U.S. companies with access to IT professionals and staffing solutions on a global scale."

Best@IT works with a wide range of clients. One sample client that depicts a wide range of Best's Services is Nortel Networks. "With Nortel, we provide network engineers and equipment installers, on a contract basis, who are involved in the roll out of new Nortel products," says Arello. Best also recruits and trains IT professionals to become Nortel Network Certified Support Specialists. Candidates who successfully complete this highly intensive no-cost program are offered employment opportunities with Nortel Networks in systems engineering, technical troubleshooting, design architecture or sales engineering roles.

"Some other industries that we are actively involved in include financial services and the entertainment industry. In both of these cases, we fulfill contracts in which we provide project managers, business analysts and system developers. From a technology standpoint, the hottest areas are those in which we develop web applications and tools for our clients," adds Arello. "The biggest difference in the two years since we've started operations in the United States is the pace. In the past, developing mainframe solutions took two to three years from identification to implementation. Today we're operating at e-speed, taking three to six months to develop and implement new systems."

Arello says the Internet increasingly plays a role in Best's recruiting efforts. "We data mine and post to the job boards, as well as work with direct recruiting and referrals," he says. "The Internet provides a much more global candidate base for our clients."

The company looks for technical skills that include JAVA, HTML, web development, network engineering, ASP and object-oriented design and development. "More and more we need people who understand how to work in a business environment and who can then utilize the technologies to provide the solutions needed," Arello says. "I'm not sure titles or labels for positions work anymore. Instead, we need people who are business and data knowledgeable. Data is the most critical asset an organization possesses and that's where our emphasis is focused. We also are providing solutions that span across the entire enterprise, not just front-end or back-end. Our clients don't want to know what makes it all work together. They want to know that it does."

Best@IT has offices in New York, New Jersey, Los Angeles, Seattle and Dallas. "You'll want to be part of Best because of the projects we're involved with. Our clients are working on the edge, and we're there with them, helping to push that edge forward. Furthermore, because we are out on the edge, pushing at new technologies and operating paradigms, we must be more than competitive in terms of pay and benefits," says Arello.

Complete Business Solutions, Inc. (CBSI)
Portland, OR

Complete Business Solutions, Inc., headquartered in Farmington Hills, MI, was formed 15 years ago. However, two years ago the company took a sharp turn, linked to the emerging uses of the Internet and web, acquiring and merging with several other firms. Today, CBSI provides full life-cycle e-business consulting for middle-tier clients, from startups to those with $2-4 billion a year in revenues.

"Here in the Pacific Northwest, we focus on serving the Northwest in e-business, data warehousing and development of IT strategies to resolve business issues," says Mike Ryan, vice president for the Pacific Northwest Region. "Our e-business sector runs the gamut, from basic dot-coms that need a site up and running to business-to-business and business-to-consumer sites and replatforming legacy systems to new technologies."

CBSI currently is in need of skills across the full life-cycle of an e-business engagement. Senior architects are needed to set the overall solution direction of a project, based on experience across multiple technologies. "The senior architect dialogues with the clients to understand their objectives and lay out pros and cons of different technological paths that could be taken," explains Ryan. Managing the project from beginning to end is a project manager, familiar with the iterative orientation of RUP (rational unified process). Other needs include analysts with UML methodology background, junior architects to develop detailed specifications and design, and developers to build the application code. Finally, testers are needed to assure the system does what it is supposed to do.

CBSI works with a variety of clients, including manufacturers and healthcare institutions. "Most of our clients are of medium size in the middle-tier and look to us to work with them to deliver their major information technology projects," says Ryan. "They expect us to turn the project for them, from strategy through project delivery to knowledge transfer and setting up ongoing maintenance."

In the Pacific Northwest region alone, CBSI plans to hire approximately 50 people in 2000. "It's a fun place to work, with fun people. People at CBSI have the enthusiasm and positive attitude that keep our business going," adds Ryan.

IT Careers in Consulting

"We offer a flexible environment, focused on giving people projects where they will be challenged, where they can push the envelope and still have a sane lifestyle that balances client/business and employee needs."

Corio, Inc.
Redwood City, CA

Most people know Corio, Inc. as an application service provider, supplying support and applications for myriad business requirements. Corio Consulting,however, is a second function of the company, providing implementation, customization and general consulting to businesses whether they have an ASP contract or not.

Andrea Holko, vice president of consulting/Western region, says the consulting challenges range from aligning IT with business needs to total system development and implementation. "Many times our work is about taking a start-up business from the point where it's using a simple bookkeeping application into full growth mode operation. Our clients look to us to understand the impact of dimension and scale as they position themselves for growth."

Holko is looking for a variety of skills, including mature consulting capability. "It also helps to have a large systems development, implementation and project management experience, and a background in managing a large, complex client relationship," she says. "Our niche is in providing rapid implementation sometimes in just four weeks, so it's important that people understand life-cycles of businesses and products and then apply that knowledge in a light-speed environment." Specific skills needed include an understanding of the technical underpinning of the applications Corio supports, Peoplesoft, SAP SIEBEL, C1, Broadvision MOAI and other e-commerce tools for commerce development and integration, as well as a deep functional knowledge of the software and the business process which support those applications.

To add value in the traditional consulting and ASP markets, Corio Consulting focuses employees on customer satisfaction and repeatable business. "Because of the way we work, our consultants need to have an understanding of a broad range of business functions and applications. Cross training is necessary," says Holko. "The culture is entrepreneurial, and our work allows us to make a significant impact on our clients' operation."

DMR
Edison, NJ

DMR Consulting has about 9,000 employees, all helping their customers develop everything from e-commerce applications to customer response management systems. However, the company also provides a fair amount of outsourcing service to clients. "We've found that customers find it difficult to maintain applications in a cost-effective manner, so they outsource," explains John Wighton, vice president-resource management for DMR Consulting in the United States.

DMR Consulting has 26 offices across the United States, 14 offices in Canada and another 25 offices throughout the United Kingdom, the Netherlands, Spain, Australia and Kuala Lumpur. DMR Consulting distinguishes itself as one of the top 25 international IT consulting groups in the world, providing services to aerospace, banking, telecommunications and pharmaceutical industries. "We are a best option for people interested in growing technical careers on a worldwide basis," says Wighton. "We can offer you challenges in a variety of directions."

Beginning on day one, DMR Consulting employees are paired with a career adviser. "This is a complex career, and we try to make sure DMR Consulting works for you," says Wighton. Each career advisor works with just five employees. "They'll challenge your ideas and strengths so that you get the most benefit from opportunities. Advisors also help you as we match projects to your needs." In fact, DMR Consulting has an online system that helps match employees to the available assignments. Employees will be able to bid on assignments themselves in the next release of software.

DMR Consulting is looking for people with web development and industry experience. "We look for team players and positive attitudes. That's hard to draw out on a resume," says Wighton. "We've found that team players provide the best long-term solutions for clients and have the best track record with us."

DMR Consulting expects to hire another 1,000 consultants over the next 12 months. "The demand is tremendous, so it's an aggressive target," says Wighton. "DMR Consulting is interested in having an open dialogue with the people who work here, giving them choices is what employees want. We are a company that likes to catch people doing good things, and that's a big change from standard business operations."

Diamond Technology Partners
Chicago, IL

In 1994 Diamond Technology Partners began business as a strategy firm, helping businesses deal with technology as a disruptive force. Today, as the Internet has taken hold, the group still focuses on strategy but is committed to also developing "killer apps" with clients.

Anthony Abbattista, a partner at Diamond Technology Partners and head of its Diamond Marketspace Solutions Practice, says the company moved from helping clients on profit-improvement methods and processes to identifying, building and launching e-businesses on an accelerated timeline. "We remain trusted strategic advisors, but we also focus on end-to-end delivery of e-business potential," explains Abbattista.

Diamond Technology Partners works in the communications, media, financial services, healthcare and products markets. In addition to developing strategies and applications, the group also is working with multi-company clients to develop online exchanges involving industrial products. Diamond works with clients in both the B2B and B2C arenas.

Among its clients is Simon Properties Group, the largest publicly traded retail mall developers in North America. "We are working with the group to leverage all the bricks and mortar through the Internet," says Abbattista. "We've helped them construct their own incubator to test new ideas and infrastructures. FastFrog.com is one of the results of that incubator – an appeal to teenagers who basically can prepare a virtual registry or wish list that uses the mall as a delivery mechanism."

A similar development has been YourSherpa.com – it's a service for those people who would like to buy more than they can carry away from a mall. Targeted at the mature shopper with disposable income, the program provides shoppers with a zapper that they use to identify their shopping list. It's uploaded, can be gift-wrapped and even delivered when and where they want.

"We want to work with industries where we can be innovative and where the work will be interesting for our employees," says Abbattista. "Our clients are doing spin outs or carve outs of their businesses and are working at a furious pace to get there."

Diamond Technology Partners is looking for smart people, in terms of street smarts and book smarts. "We need people who are naturally curious and who want to expand their scope – the technologist who is also interested in the financial end of a new business and who likes to tinker," says Abbattista. "We pay well, but more important is that we treat one another well and expect people to work on their own destiny."

IT Careers in Consulting

Technical skills needed include technology media, web-based technologies, and raw talent and aptitude. "In the past we didn't hire less than an MBA, but today we're doing undergraduate recruiting in addition to experienced hiring. As we blend together our culture, curiosity and smart people, we put a lot of value on having fun. You can choose to be a knowledge leader or a project leader on everything from value delivery to programming teams to research."

Diamond Technology Partners plans to hire more than 200 new practice employees in 2000, up from approximately 550 today.

Omicron Consulting Philadelphia, PA

Omicron Consulting is a premier e-business consulting firm concerned about relationships, not projects. "We attract the most qualified people who want to work with cutting-edge technologies and the most advanced tools," says Valerie DeRusso, chief operating officer for Omicron. The company performs a variety of services, from helping companies establish an e-vision plan for their businesses, to software and e-commerce application development, network infrastructure design, deployment, training and customer support.

"People who apply to work for Omicron are highly motivated people who want to work with the latest technology and need the excitement of something new, moving from assignment to assignment for variety," says DeRusso. She notes that the company isn't married to any one technology for clients, but encourages research and development in technologies that truly meet client needs.

Omicron provides services to the food service, pharmaceutical, utility, entertainment, retail, chemical and manufacturing industries. "We need people with vision, who have management consulting experience, and who can apply technology to a vertical market," adds DeRusso. "We are continually researching new tools and technologies, building prototypes and establishing where to go next from a technology perspective."

As with more and more of the attractive employers, Omicron isn't interested in people with less than a two-year stint somewhere. "We look for how you have leveraged your skills, your stability with previous employers, and your ability to adapt to new technologies and business drivers," says DeRusso.

DeRusso says Omicron doesn't participate in bidding wars for highly talented individuals. "Money does not buy loyalty," she says. "Omicron is a place where the environment is strong, where employees understand the job to be done and they do it. They have families and commitments, which means we have to be very flexible. We make sure people are paid and rewarded for the work they do." In addition to base pay, employees receive bonuses based on performance on at least a quarterly basis (sometimes more frequently, depending on the customer's goals and needs). Employees are also eligible for discretionary and project bonuses. She believes one of the strongest selling points for Omicron is the loyalty employees have for the firm and the loyalty the firm has for its staff. "We understand what showing appreciation means to people. We know one another, and as a company we're committed to helping people personally and professionally."

Privately held, Omicron anticipates a 15 percent jump in employment in the year 2000.

Webb Information Services Minneapolis, MN

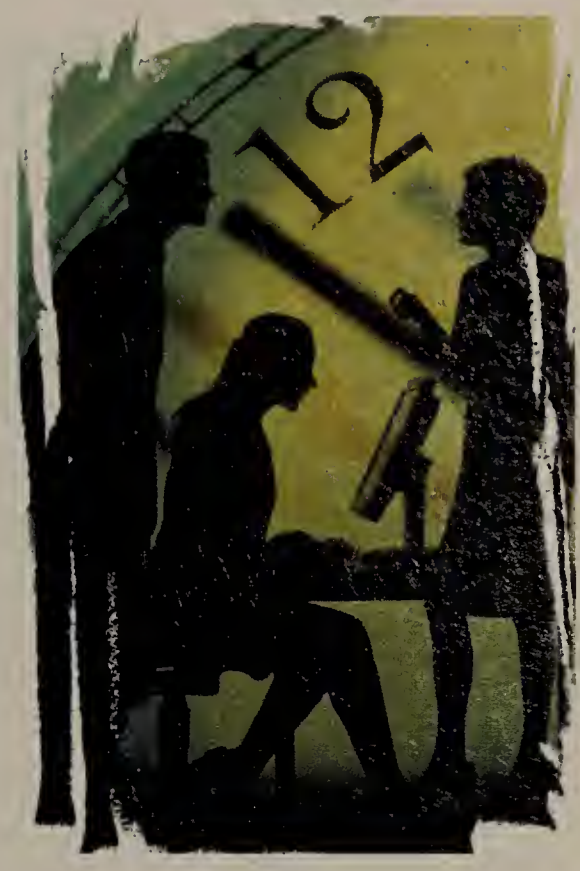
Todd Webb, CEO of Webb Information Services, talks about consulting as if he's coaching a baseball team. "The company was founded two years ago because I saw an opportunity," he says. "The players in the consulting businesses and whose uniforms were getting dirty were not given the flexibility or compensation they deserved. Our goal is to allow the players who are winning the game to be treated fairly and to be compensated accordingly."

A 15-year consulting veteran, Webb developed a business model in which people are technically challenged, working with leading companies on front-edge problems. "The difference is that we wanted employees to be able to achieve their financial goals and have complete control of their careers." To do so, Webb offers different types of employment: traditional employment with base pay, benefits and holidays; and hourly employees who receive full benefits but no vacation – they are paid for what they work while still having benefits. "They receive 70 percent of what we bill to our clients," explains Webb. "Partnering with employees is a reality here."

Because of this business model, Webb had to add some features for employees. Training and certifications are made available, based on what clients need. "We also assign a dollar amount to billables that is allocated for training in whatever the employee wants, whether it's a conference, tuition, software or whatever. This puts the consultants in control of their training, with a budget to select what interests them."

The last piece of the game strategy for employees is that they choose their own engagements. "We present a project or company to the employees – the location, responsibilities, money – and they decide whether it's a fit," says Webb. "It's a real change that is a plus for our customers – our consultants are working with them because they want to be there."

Webb provides four services: consulting and software development, value-added resale of software and hardware, system integration, and full-time placement of outsource employees with clients. "The consultants who work here like the package because it attracts the kinds of clients they want to work with," says Webb.



Among these are BestBuy and BestBuy.com. Currently, Webb Information Services is developing an e-commerce application and ERP implementation for the corporation. For SuperValue retailer, the company is consolidating 35 separate applications into one that is Java and Java Bean based.

"We look for three things in recruiting," Webb says. "We look at the type of applications you have experience with, particularly for e-commerce, web-enabled tools, intelligence and ERP. We also look at the tools you've used to design solutions – we are big into object-oriented, visual studio set, Java, relational database, NT and UNIX. The third thing is who you've worked for in the past and their technology focus."

Webb believes talented people want to work in the type of environment he's creating. "And you'll have the opportunity to work on applications at the forefront of today's market. You'll be working with clients like Lucent, American Express and Cargill. But mostly, we believe you'll like our business model, where you're in control of the whole process."

For more job opportunities with consulting companies, turn to the pages of IT Careers.

Interested in IT Careers?

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.

Produced by Carole R. Hedden
Designed by Aldebaran Graphic Solutions, Inc.

Network World, Inc.

118 Turnpike Road, Southborough, MA 01772
Phone: (508) 460-3333

TO SEND E-MAIL TO NWW STAFF
firstname_lastname@nww.com

Evilee Thibeault, President/Publisher
Eleni Brisbois, Administrative Planning Manager

FINANCE
Mary Fanning, Vice President Finance
Paul Mercer, Finance Manager
Mary Kaye Newton, Billing/AP Coordinator

HUMAN RESOURCES/BUSINESS SERVICES
Monica Brunaccini, V. P. Human Resources/Business Services
Elizabeth Price, Human Resources Manager
Eric Cormier, Human Resources Associate Rep.
Frank Coelho, Business Services Manager
Lisa Smith, Business Services Administrator
Mark Anderson, Business Services Supervisor
Brian O'Keefe, Business Services Conrdinator
Nancy Maiorana, Business Services Assistant

MARKETING
Hillary Freeley, Senior Director of Marketing
TerryAnn Croci, Marketing Communications Manager
Wendie Larkin, Public Relations Manager
Barbara Sullivan, Senior Research Analyst
Donna Kirkey, Marketing Design Manager
Kristin Wattu, Graphic Designer/Marketing Specialist
Judy Schultz, Graphic Designer/Marketing Specialist
Cindy Panzera, Graphic Designer/Marketing Specialist

GLOBAL PRODUCT SUPPORT CENTER
Nancy Parquette, Corporate Programs Manager

ADVERTISING OPERATIONS
Karen Lincoln, Senior Director of Advertising Operations
Ann Jordan, Supervisor of Advertising Operations
Maro Eremyan, Advertising Coordinator
Kris Guay, Direct Response Ad Coordinator
Christopher Cormier, Web Newsletter Coordinator
Cheryl Hill, Traffic Coordinator

PRODUCTION
Ann Finn, Senior Production Director
Greg Morgan, Production Manager
Mike Guerin, Print Buying Supervisor

CIRCULATION
Sharon Smith, Senior Director of Circulation
Richard Priante, Director of Circulation
Christine Rhoder, Circulation Marketing Manager
Bobbie Cruse, Subscriptions Manager
Mary McIntire, Sales & Marketing Coordinator

RESEARCH
Ann MacKay, Research Director

DISTRIBUTION
Bob Wescott, Distribution Manager/(508)879-0700

IDG LIST RENTAL SERVICES
Paul Capone, Account Executive
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0825, FAX:(508) 370-0020

SEMINARS AND EVENTS
Robin Azar, Vice President of Events
Steven Engel, General Manager Seminars & Events
Andrea D'Amato, Sales Director/Strategic Partnerships
Debra Becker, Dir., Marketing & Audience Development
Kevin Gilligan, Event Producer
William Bernardi, Senior Manager, Logistics and Operations
Kristin Ballou, Event Sales Manager, Eastern Region
Lisa McLaughlin, Event Sales Manager, Western Region
Sandy Weill, Event Account Manager, Seminars & Events
Betty Amaro, Senior Financial Analyst
Jill Keaveney, Senior Event Planner
Tim DeMeo, Event Coordinator
Ted Gulley, Marketing Manager
Tricia Fiscale, Sales and Marketing Coordinator
Jennifer Suwalski, Event Services Representative

ONLINE SERVICES
Charley Spektor, General Manager
Adam Gaffin, Executive Editor, Dnline
Sandra Gittlen, Managing Editor
Jason Meserve, Staff Writer
Sheryl Hodge, Dnline Copy Editor
Marlo Matoska, Web Producer

INFORMATION SYSTEMS/NEW MEDIA SERVICES
Michael Draper, V. P. Systems & Technology
Tom Kroon, Senior Software, Engineer/Architect
Bob Roddy, Senior Web Producer
William Zhang, Senior Software Engineer
Adam Chace, Web Software Engineer
Rocco Bortone, Network Manager
Peter Hebenstreit, Network Specialist
Kevin D'Keefe, Systems Support Manager
Brian Wood, Senior Systems Support Specialist
Pam Gertsios, Systems Support Specialist
Anne Nickinello, Director of New Media Services
Deborah Vozikis, Senior Imaging Specialist
Sean Landry, Web Producer
Michael Ferreira, Graphics Production Coordinator

IDG

Patrick J. McGovern, Chairman of the Board
Kelly Conlin, CEO

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

NetworkWorld seminars & events *Network World Seminars and Events* are one and two-day, intensive seminars in cities nationwide covering the latest networking technologies. All of our seminars are also available for customized on-site training. For complete and immediate information on our current seminar offerings, call a seminar representative at 800-643-4668, or go to www.nwfusion.com/seminars.

NetworkWorld

EDITORIAL INDEX

3Com 23,35
A
Asante Technologies 23
AT&T 34
AudioSoft 40
Axcelerant Group 33
C
Cisco 10
E
Ericsson 35
F
Flashcom 33
G
Genuity 33
H
Hewlett-Packard 23
I
IBM 26,38
ICO Global Communications 33
Intel 10,26
M
Microsoft 12,26,35
N
Netopia 33
Nortel Networks 26
Novell 10,36
Nullsoft 40
O
Oracle 10,14
P
PeopleSoft 119
Pirus 23
PSINet 33
Q
Quantum 23
S
SoftQuad Software 35
Sprint 12
Sybase 35
T
Teledesic 33
W
WorldCom 12,42
Worldweb.net 35

ADVERTISER INDEX

Advertiser	Page #	URL
ACI International	98	www.aci.com
Adtran	8	www.adtran.com
American Power Conversion	105	www.apcc.com
Anritsu Company	40	www.us.anritsu.com
AOpen America	86	www.aopenusa.com
Apex Inc	32	www.apex.com
Bay Technical Associates	101	www.baytechdcd.com
Black Box Corp	81	www.blackbox.com
Brocade Communications	69	www.brocade.com
Buffalo Technology	24-25	www.buffalotech.com
*Cablevision	60	www.lightpath.net
Castle Rock Computing	101	www.castlerock.com
Computer Associates	2-3	www.cai.com
Connect-Tek	106	www.connect-tek.com
Crossroads	4	www.crossroads.com
CrossTec Corp	84	www.crossteccorp.com
Cubix Corp	105	www.cubix.com
Cybex Computer Products	96	www.cybex.com
Digital Image	101	www.dii-megachips.com
E-Comms Inc	101	www.e-comms.com
Ecrix Corp	88	www.ecrix.com
ePeople Inc	11	www.epeople.com
Exabyte Corp	74-75	www.m2wins.com
Extreme Networks	22	www.extremenetworks.com
Foundry Networks	49	www.foundrynetworks.com
Global Technology Associates	102	www.gnatbox.com
Globix	6	www.globix.com
Golden Gate University	102	www.ggu.edu
*GTE	19	www.gte.com
Hughes Network Systems	79	www.bizinfo.direcpc.com
IBM	27, 123-126	www.ibm.com
Intel Corp	13, 15, 17, 37	www.intel.com
Interliant	67	www.interliant.com
Internet Security Systems	34	www.iss.net
ITcareers.com	121	www.ITcareers.com
Learnkey Inc	102	www.learnkey.com
Linux Networx	46	www.linuxnetworx.com
Mentor Technologies	30	www.mentortech.com
Motorola	28-29	www.digitaldna.motorola.com
Net to Net Technologies	103	www.nettonettech.com
Network Ice	76	www.networkice.com
Network Instruments	100	www.networkinstruments.com
Network Technologies	102	www.nti1.com
Nokia Internet Communications	44	www.nokia.com
Novell Inc	57	www.developer.novell.com
PowerQuest Corp	92	www.powerquest.com
Pulizzi Engineering	104	www.pulizzi.com
Quad Research	71	www.quadresearch.com
Radware	82	www.radware.com
Raritan Computer	104	www.raritan.com
Red Creek	68	www.redcreek.com
RiverSoft	83	www.riversoft.com
Rose Electronics	100	www.rosel.com
SAMW inc	97	www.samw.com
SAP	21	www.mysap.com
Savvis	63, 65	www.savvis.net
*SBC Communications Inc	19, 60, 72	www.sbc.com
SBC Communications Inc	31	www.sbc.com
Server Technology	104	www.servtech.com
Solunet Inc	97	www.solunet.com
TelekomNet	54	www.telekomnet.com
Transistor Devices	70	www.tdipower.com
Tron International	99	www.tron.com
TrueTime	104	www.truetime.com
Viatel	52-53	www.viatel.com
Visual Networks Inc	59	www.visualnetworks.com
Wave Technologies	98	www.waveleaming.net
Western Telematic	98	www.wti.com
World Data Products	101	www.wdpi.com
Zaxus	94	www.zaxus.com

Network World Fusion - www.nwfusion.com

3Com	Micron
Alcatel	Microsoft
American Power Conversion	NeTrue Communications
ArrowPoint Communcations	Network Associates
Cisco Systems	Oracle
Entera Inc.	RedCreek Communications
Excelon	RSA Security Dynamics
Go America	Sprint
IBM	Sun Microsystems
IntraWare	Visio Corporation
Lucent	Yipes
Mercury Interactive	

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publisher does not assume liability for errors or omissions.

*Indicates Regional/Demographic

Sales Offices

Carol Lasker, Associate Publisher/Vice President
Debbie Lovell, National Sales Operations Manager
Internet: clasker, dlovell@nww.com
(508) 460-3333/FAX: (508) 460-1237

NEW YORK/NEW JERSEY
Tom Davis, Associate Publisher, Eastern Region
Elisa Della Rocco, Senior District Manager
Elizabeth Ardizone, Account Executive
Aimee Jacobs, Sales Assistant
Internet: tdavis, elisas, eardizone, ajacobs@nww.com
(201) 587-0090/FAX: (201) 712-9786

NORTHEAST
Donna Pomponi, Regional Sales Manager
Kathryn Zinn, District Manager
Linda Bishop, Sales Assistant
Internet: dpomponi, kzinn, lbishop@nww.com
(508) 460-3333/FAX: (508) 460-1237

MID-ATLANTIC
Jacqui DiBianca, Regional Sales Manager
Lisa Londrillo, Sales Assistant
Internet: jdibian, llondrillo@nww.com
(610) 971-1530/FAX: (610) 975-0837

MIDWEST/MARYLAND
Eric Danetz, District Manager
Aimee Jacobs, Sales Assistant
Internet: edanetz, ajacobs@nww.com
(201) 587-0090/FAX: (201) 712-9786

CENTRAL
Dan Gentile, Midwest Regional Director
Kristin Baker, Fusion Coordinator/Sales Associate
Internet: dgentile, kbaker@nww.com
(512) 249-2200/FAX: (512) 249-2202

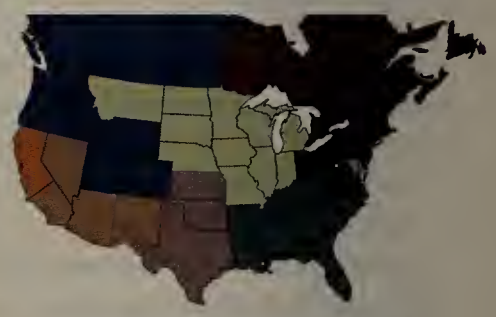
NORTHERN CALIFORNIA
Sandra Kupiec, Associate Publisher, Western Region
Miles Dennison, Regional Sales Manager
Lara Greenberg, Senior District Manager
Sean Weglage, District Manager
Lisa Otterson, Regional Sales Operations Manager/Account Exec.
Carmella Baglione, Account Executive
Anna Reyes, Sales Assistant
Grant Turner, Sales Assistant
Internet: skupiec, mdennison, lgreenberg, sweglage, lotterson, cbaglione, areyes, gturner@nww.com
(650) 577-2700/FAX: (650) 341-6183

NORTHWEST/ROCKIES
Carol Stiglic, Regional Sales Manager
Karen Weiss, Regional Sales Manager
Internet: cstiglic, kweiss@nww.com
(650) 577-2700/FAX: (650) 341-6183

SOUTHWEST
Becky Bogart Randell, District Manager
Tiffany Wortham, Account Executive
Joel Schwartz, Sales Assistant
Internet: brandell, twortham, jschwartz@nww.com
(949) 250-3006/FAX: (949) 833-2857

SOUTHEAST
Don Seay, Regional Sales Manager
Terry Sanders, Sales Assistant/Account Executive
Internet: dseay, tsanders@nww.com
(404) 845-2887/FAX: (404) 250-1646

FUSION
James Kalbach, Sales Manager
Jeff Schwartz, Account Executive
Robert Koenig, Account Executive
Internet: jkalbach, jmschwartz, rkoenig@nww.com
(610) 341-6025/FAX: (610) 971-0557



DIRECT RESPONSE ADVERTISING
Response Card Decks/Marketplace
Richard Black, Director of Direct Response
Karima Zannotti, Account Manager
Enku Gubaie, Account Manager
Cara Peters, Account Manager
Amie Gaston, Account Manager
Sharon Chin, Sr. Media Dev. & Operations Mgr.
Chris Gibney, Sales Operations Coordinator
Internet: rblack, kzannott, egubaie, cpeters, agaston, schin, cgibney@nww.com
(508) 460-3333/FAX: (508) 460-1192

IT CAREERS
VP/General Manager, Janis Crowley,650-312-0607, New England Sr. Account Manager, Nancy Mack, 508-370-0870, MidAtlantic Regional Manager, Deanne Holzer, 212-828-6691, Midwest Regional Manager, Laura Wilkinson, 773-248-4301, Midwest Account Manager, Donna Dugo, 312-587-1390, West Regional Manager, DeForest Smith, 650-312-0617, Senior Account Manager, Andrea Denny, 916-442-2334, West Account Manager, Whitney Nagy, 650-286-2732, East Regional Manager, Elizabeth Meyer, Marketing Director, Kelli Flanagan, 650-312-0544, Marketing Specialist, Chantelle Finney, 650-525-3450, Operations Manager, Donna Kent, 650-525-3457, Advertising Coordinator, Luan Nguyen, 650-312-0572, Midwest Sales Associate, Rochelle Caravaca, 650-312-0542, Eastern Sales Associate, Leilani Lopez, 650-312-0518, Western Sales Associate, Gloria Gonzales, 650-312-0521

Publicize your press coverage in *Network World* by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500 and up. To order, contact Reprint Management Services at Greenfield Corporate Center 1811 Olde Homestead Lane, Lancaster, PA 17601 (717) 399-1900 fax (717) 399-8900. E-mail rtry@rmsreprints.com

PeopleSoft debuts Web-enabled ERP suite

Company's PeopleSoft8 package includes new supply-chain, call center applications.

BY ELLEN MESSMER

PLEASANTON, CALIF. — PeopleSoft last week announced a Web-enabled upgrade to its enterprise resource planning suite that will spare customers the chore of distributing proprietary client software to end users.

Set to ship in September, PeopleSoft8 includes 108 applications for human resources, supply-chain and financial management, all retooled for the Web. It also includes 59 new applications, mainly for call center and Web-based customer resource management, which PeopleSoft acquired through its purchase of Vantive.

PeopleSoft customers say they are eager to take advantage of the Web-enabled applications.

"We'll definitely use this when it's ready," says Kay Clarey, executive director of the U.S. Treasury's Capital Investment Review Board, which selects and manages the department's IT assets.

The Treasury, which has installed the PeopleSoft human resources application, has limited its use of PeopleSoft to a few hundred end users because it was difficult to distribute the cumbersome client software to individual desktops.

But the Web-enabled PeopleSoft8 will let any authorized user with a browser make use of the application to obtain or enter information over the Web. The Treasury plans to deploy more PeopleSoft applications, such as financials modules.

PeopleSoft executives say Version 8 will provide organizations the means to promote customer self-service, whether it be employees making address changes or a trading partner checking on customer shipment status as part of the PeopleSoft supply-chain application.

"With the financials application, for example, you can check for funds availability on a real-time basis," says Chuck Giraud, vice president and general manager of PeopleSoft's federal technology section.

Because the PeopleSoft applications can be linked together for workflow purposes, organizations can use the suite to accept purchase orders placed at a Web site, and then have those purchases automatically applied against a negotiated contract. That would result in a drawdown on a contract account, which PeopleSoft would compute and display to show the contract status.

PeopleSoft says Version 8 will also support XML for customers who want to exchange documents or set up an XML-based search engine.

PeopleSoft8 will include a revamped version of the Vantive customer relationship management (CRM) software for call center and Web-based CRM. These applications will provide a common view into a customer's interaction history, whether it originates via the telephone or e-mail.

PeopleSoft, which has about 2,400 enterprise customers, prices its applications on a customer-specific basis. Typical deployments range from several hundred thousand to several million dollars. ◪

Power to the people: PeopleSoft8 debuts

Among the new features:

- 108 enterprise resource planning software modules rewritten for the Web.
- 59 new modules added, primarily for customer relationship management.
- Web browser replaces earlier version's proprietary client software.

PeopleSoft8, set to ship in September, is an enterprise resource management system that includes integrated software modules for human resources, financials, supply-chain management and customer relationship management.

V.92,
continued from page 9

having to redial, wait for the modems to set up and then log on again.

While broadband access methods such as DSL and cable modems are making inroads against dial-up modems, analog modems will still dominate remote access through 2004, according to IDC in Framingham, Mass. (see graphic, page 9).

For those still using dial-up modems, the new V.92 features will make telecommuting and remote access more efficient, says Kevin Lacey, a firmware development manager for U.S. Robotics. Lacey not only works on U.S. Robotics' V.92 modem development, but he is a telecommuter who uses a dial-up connection to link to his office.

He says the call-waiting feature will let people work at home without buying a separate phone line for Internet connections. And the feature will encourage him to stay connected consistently throughout the day rather than checking in periodically for e-mail. That could save him time and work by keeping him better updated about what progress other members of his team have made on projects and thereby letting him avoid duplicating work.

The technology

Current 56K bit/sec modems (V.90) work at top speed only if one end of the connection is digital, such as a T-1 phone line to a corporate site or to an ISP. The other end is an analog connection like the one available on a single-line phone.

In the downstream direction — that is, from an ISP or corporate server to a user's PC modem — a V.90 modem can pass data at 56K bit/sec on a good-quality circuit. But the upload speed maxes out at 33.6K bit/sec.

In the rush to get V.90 approved, standards makers decided to use the upstream modulation scheme used in the previous fast modem, V.34. It had a top speed of 33.6K bit/sec. Now with more time, they have found a way to boost the top upload speed to 48K bit/sec by dropping the old modulation scheme and adopting the same method used in the downstream direction.

Upstream is slower than downstream because it involves converting the analog signal to digital, which impedes the data flow.

V.92 modems will also be able to handshake faster than V.90, cutting the time to start a session from about 30 seconds to as low as 10 seconds, including dialing time, according to Craig Garen, general manager for client access for Lucent Technologies. Some of the steps in the current startup are overkill, and they have been cut from the new standard, *Communications Standards Review's* Krechmer says.

Another difference is that current modems ignore the call waiting beep that phone switches send to customers when they have an incoming phone call and are logged on to the Internet using the same phone line. Some modems are fragile enough that they drop sessions when they hear this tone.

V.92 modems will use the beep to trigger an on-hold feature. The customers' modem and the server modem being called will agree to suspend the session for a set period of time ranging from 1 to 16 minutes. That lets the customer take the incoming call, then switch back to the Internet connection. The modems have to resume their session, but without redialing or retraining from scratch.

If a customer has caller ID as well as call waiting, modem makers could fashion software that displays that an Internet user has an incoming call and what the calling number is, says U.S. Robotic's Lacey.

The V.92 standard has won preliminary approval from the International Telecommunication Union, an endorsement that invariably leads to full ratification. Krechmer says he expects the standard to be set in September.

Vendors say they are gearing up to deliver modems by early next year. PCTel, a PC software-modem maker, says it will be able to upgrade its current modems with a software download by early next year. Major modem vendors U.S. Robotics and Lucent Technologies are more aggressive, saying they will ship V.92-compliant gear by the third quarter of this year.

These vendors also say they are already working on making their V.92 modems compatible with those made by other firms.

Furthermore, if a V.92 modem calls a V.90 modem, it will be able to interoperate as a V.90 modem. ◪

Modems are booming

Sales of analog modems will grow from 41.8 million units today to 59.9 million in 2004.

SOURCE: IDC, FRAMINGHAM, MASS.

www.nwfusion.com

FLASHBACK: 56K BATTLE

In 1996, 56K modems were threatened by a war between two incompatible technologies. With unprecedented speed, vendors settled on a single standard and a man named Brett Townshend made millions from his 56K technology. Find out more online.

DocFinder 90419

find it

Sphere extends convergence beyond headquarters

Access device ties branch offices into corporate and public phone networks via an ATM link.

BY PHIL HOCHMUTH

Sphere last week announced a new device that will let companies extend converged data and voice networks to remote and branch offices without having to install a lot of new equipment at those sites.

The VIM100-TE1 is an integrated access device (IAD) that can be used to bring all the features of Sphere's Sphericall.ems converged voice/data network to a company's branch offices or multiple buildings in a campus environment.

Sphericall.ems, which must be purchased separately, is a system of Windows NT-based call management servers and hubs that lets voice travel over a single IP or ATM network.

"The VIM is an affordable way to deliver multimedia services to a remote office," says Morgan Mann, director of product management for Sphere. "The value is that you're able to extend your telephony to remote sites as opposed to having to rebuild it at all of your remote locations."

Companies can also inexpensively extend advanced telephony features and applications built on top of a Sphericall infrastructure, such as unified messaging, integrated e-mail/voice mail and call management applications, Sphere says.

"Traditional IADs maintain a PBX infrastructure" at a remote site, Mann says. "The whole idea of convergence is to eliminate that PBX infrastructure because that's where the cost savings and productivity enhancement come from."

The VIM100-TE1 connects to a corporate backbone via a T-1 or E-1 ATM WAN connection (see graphic). A fiber-based OC-3 ATM port also provides a connection to a metropolitan-area network or to another building in a corporate campus network. For connecting branch-office users, the device has eight ports to connect Sphere's VBX PhoneHubs and COHubs. Individual office phones plug into a VBX PhoneHub, which is connected to the VIM100-TE1. A VIM100-TE1 supports up to 150 phones. A COHub acts as a gateway between a VIM100-TE1 and a PBX or the public phone network.

Phones in the remote office can access Sphericall features and the PSTN via the ATM link to the main corporate site. Alternatively, these phones can access the PSTN through a local COHub. The device also has one 10Base-T Ethernet port for connecting users to an enterprise data backbone.

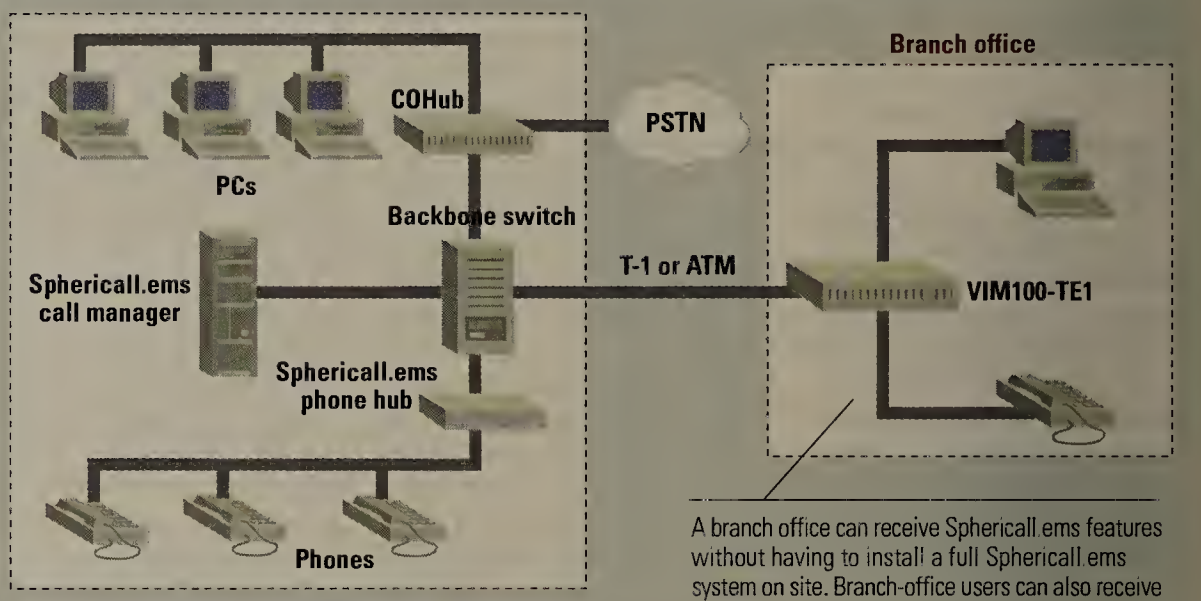
Analysts predict that over the next several years products that can replace traditional PBX systems with converged voice/data equipment will become a hot commodity. IDC, a research firm in Framingham Mass., says the market for these devices will grow from $240 million this year to $1.38 billion in 2003. IDC also forecasts that usage of voice over IP by U.S. businesses will jump from 1.16 billion minutes this year to 33.19 billion minutes in 2003.

The VIM100-TE1 will be available this month for $5,500.

Sphere: www.spherecom.com

Extending convergence

Sphere's VIM100-TE1 integrated access device (IAD), along with Sphericall.ems converged voice/data network, lets companies extend network services to branch offices.



Corporate headquarters with Sphericall.ems-based converged network

A branch office can receive Sphericall.ems features without having to install a full Sphericall.ems system on site. Branch-office users can also receive toll-free calls to the company headquarters.

Intel gear to improve bandwidth mgmt.

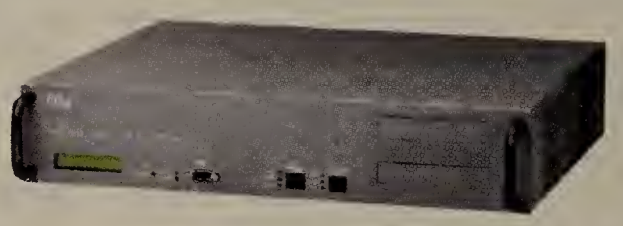
BY JAMES NICCOLAI

Intel last week uncorked two network appliances designed to help customers manage the allocation of bandwidth across their enterprise networks.

The new NetStructure 7340 Traffic Shaper and 7370 Application Shaper are based on a bandwidth management technology called PacketWise, which was developed by Packeteer in Cupertino, Calif.

Intel described the new products as "traffic cops" because they can be used to monitor how the available bandwidth in a network is being used and to set priorities to provide additional capacity for more important applications and customers.

"With what bandwidth you do have, the most important things should be done first. Not all transactions are created equal," Barry Hartman, product line manager in Intel's network equipment division.



Intel's 7340 Traffic Shaper can boost performance of key applications.

The Intel appliances are aimed at ISPs, application service providers and large companies that would benefit from having a greater ability to prioritize traffic in their networks.

Intel's 7340 Traffic Shaper, which is priced at $24,995, lets customers prioritize network bandwidth to improve the performance of key applications.

The 7370 Application Shaper, priced at $29,995, is a policy-based subscriber management system and includes a broader set of features, including the ability to validate service-level agreements and to integrate billing functions, Intel said.

Separately Tuesday, Packeteer announced the Internet Security Accelerator 50, a product designed to speed the time it takes to make a transaction on the Web. Dubbed the ISX 50, the product is based on Intel's Secure Sockets Layer acceleration technology. It is scheduled to be available in August in the U.S. and overseas priced at $12,995.

Niccolai is a correspondent with the IDG News Service.

Network World, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian international Publication agreement #0385662. *Network World* (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by *Network World*, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on the information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-490-6444.

Nonqualified subscribers: $5.00 a copy; U.S. - $129 a year (except Washington, DC,$136.74); Canada - $160.50 (including 7% GST, GST#126659952); Central & South America - $150 a year (surface mail); Europe - $205 a year (surface mail), all other countries - $300 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor,Mich. 48106.

PHOTOCOPYRIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by *Network World*, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

BPA INTERNATIONAL

BPA TAG

Copyright 2000 by *Network World*, Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Reprint Management Services, 147 West Airport Road, Lancaster, PA 17606-5363, (717) 560-2001.

USPS735-730

Your intern wants a bigger salary than you.

In today's hot IT job market, "paying your dues" can mean working for less than six figures. And that's not only good for IT newcomers. It's great for you, too. Because right now, your IT experience has never been worth more. Want proof? Sign up for free Job Alerts from ITcareers.com. We have tens of thousands of serious IT opportunities at some of the world's best-paying and best-run companies. When one of our posted positions matches your profile, we'll alert you right away. ITcareers.com is a service of the ITworld.com network, the industry's most trusted resource for all the latest IT news, products, job listings and more. To start your search, visit www.ITcareers.com.

Backspin

The secret and scary success of skins

The secret of success is sincerity. Once you can fake that you've got it made.

—Jean Giraudoux

MARK GIBBS

Welcome to the chromed world. Have you ever noticed how much of our software can be dressed up in its party clothes for no reason other than we want it to look some way other than the way it was shipped? Does all of this chrome add to the usability of our PCs? Does it make our work better? The answer is usually "no."

It all started with software that had a customizable user interface. In the beginning, you could select what entries you wanted on menus. Later you were given the power to choose what those menu entries could do using macros, and then you were handed the overwhelming vastness of Visual Basic for Applications (see what my evil twin wrote about VBA: www.nwfusion.com, DocFinders: 9046 and 9047).

But over the past couple of years there has been an explosion of skinning — the ability to change the presentation of an application's user interface. I have no idea what the first application was that allowed you to do this, but today there are hundreds.

As "Gearhead" notes this week, that incredible triumph of freeware, Winamp, can be skinned (see story, page 40). Then there's the software version of Rocket eBook reader, NetZip, ICQ and scores of other programs — check out http://skinz.org, which offers almost 11,000 skins for a huge number of skinnable applications.

On top of skins are all the gadgets we add to our systems: things such as stock tickers that live in the system tray, clocks that float in menu bars and minibrowsers that display the latest news.

One of my favorite skinning tools and one of the most useless (in that you absolutely don't need it) is Hotbar (www.hotbar.com), which dresses up the menu and toolbar of Internet Explorer with a background graphic. Hotbar.com offers more than 25,000 skins.

I must digress here to note that much of the online advertising that I have seen for Hotbar has focused on skins that feature scantily clad young ladies. As always, sex sells or, as in this case, perhaps skin sells skins.

On a side note to my side note, the redoubtable Mr. Sterne dropped me a message with a news item: Apparently in Japan, using the latest Wireless Application Protocol-enabled telephones, you can view extremely tiny, grainy pictures of naked Japanese ladies pulled from WAP-enabled porno sites. Some pundits conclude that when a medium is used for pornography, it is bound to take off . . . for example, think of videotape and the Internet. Go figure.

In short, we're adding chrome and gadgets to our PCs at an incredible rate, and our appetites are nowhere near satiated. Indeed, if the skinning and gadgeting bug has bitten you, I'll bet you'd jump at any neat-looking software gewgaw that came your way.

But what interests me is how unsafe these toys could be. Do you think any chrome toy dealers have exhaustively tested their products for buffer overrun conditions and other back doors? Imagine a skin that is just a little bigger than standard, and so overruns a buffer, and where the excess is code that overwrites the skinning system's code with something such as the dreaded Back Orifice . . . it hardly bears thinking of.

Yet I would bet that in your organization your users have skins and gadgets in use that you have probably never seen. The implications are overwhelming — you can't stop the practice of users putting chrome on their PCs, but the risks are potentially disastrous!

All you can do is have good defenses to spot odd network and PC behavior, a work force that knows enough about their PCs to spot odd activities, and hope that any problems with skins or gewgaws stay theoretical.

New skins at nwcolumn@gibbs.com

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

The idea is irresistible: Harness the processing power of thousands or even millions of otherwise idle 'Net-connected PCs, and apply that pooled computing muscle to projects both benevolent and commercial.

Most famous among those giving this technique a go is **SETI@home (The Search for Extraterrestrial Intelligence),** which claims that about two million copies of its free program/screen saver have contributed more than 330,000 *years* worth of CPU time toward making that ultimate long-distance connection. Given those kinds of numbers, there's little wonder why start-ups such as **Distributed Science and Popular Power** are scrambling to deliver distributed computing services on a mass scale.

However, there is one question about this technique that remains as mysterious as ET's whereabouts: Can anyone really turn a buck off such a scheme?

"There is a large class of problems that can be adopted to this model," insists **Nelson Minar,** chief technology officer and co-founder of Popular Power. Minar and his company's angel investors are convinced that those computing problems — found in industries such a biotechnology, pharmaceuticals and finance — can be addressed more cost-effectively through massive distributed computing than through traditional means. And, more to the point, they are convinced that there is money to be earned by those who succeed in harnessing all of these idle PCs.

Let's grant that there will be customers and that those customers will be willing to pay. (I'm not convinced, but give them that one.)

Will there be enough PCs? After all, Popular Power isn't looking for space aliens; it's looking to make a profit. So will enough people be motivated by the paltry handful of dollars — maybe $5 or $10 per month — they stand to earn for participating?

Minar says fear not. "Intrinsically this idea is attractive to a lot of people," he says. "It's a little bit like recycling."

But even that's a double-edged analogy, given that making money from recycling has never been easy either.

Tapping into the PC mother lode — corporate networks during off-work hours — might be just the ticket to make this model successful, but here Popular Power and the like face an even more daunting challenge: security concerns.

Minar says he has that covered, too, in that Popular Power's client software plays quite safely in "a Java sandbox."

Perhaps I'm being too negative . . . yet again. Maybe these entrepreneurs will eventually convince even the most paranoid network executive that hiring out their PCs during off-hours poses no greater risk to the enterprise than electricity.

But who wants to play "Bet Your Job" on it?

If you enjoy those "dead-celebrity pools" that are all the rage, then you are: A) a sick person; B) a kindred soul; and, C) also likely to enjoy a Web site that I cannot name in this family trade publication. The site is garnering lots of attention for the amusingly cruel manner in which it chronicles the misfortunes of all those dot-com companies that look to be circling the drain.

Here's how to construct the URL: Take that naughty four-letter word that begins with "f" and make it past tense; in other words, add an "ed" at the end. Now, at the end of that six-letter combination, tack on the word "company." This gives you www.****edcompany.com.

It's vacation time. So, at the risk of becoming journalism's answer to **Wally Pipp,** I'll be turning over this space next week to my colleague **John Fontana.** (As any student of baseball history knows, Pipp made the mistake of taking a day off in June 1925. He never got his job back, as **Lou Gehrig** took his spot in the lineup and didn't miss a game himself until being ousted by **Cal Ripkin** in 1982.)

My absence is no excuse not to write. The address is buzz@nww.com.

MEET NETVISTA.

[1]mhz only measures microprocessor internal clock speed; many factors affect application performance. [2]gb equals one billion bytes when referring to storage capacity; accessible capacity may be less. [3]Estimated reseller price to end us
Pentium are registered trademarks of Intel Corporation. Windows is a registered trademark of Microsoft Corp. ©2000 IBM Corp. All rights reserved.

intel inside
pentium® III

IBM®

Introducing the first IBM NetVista™ desktop: the x40

It's refreshingly simple. It's internet-ready. It's 75% smaller than an ugly computer. The all-in-one NetVista x40. The first page of the next chapter of personal computing. IBM recommends Windows® 2000 Professional for business. To order the NetVista call 800 426 7255 or visit **ibm.com**

Intel® Pentium® III processor up to 667mhz[1] / 64-512mb sdram / 10-20gb[2] hdd / cdrom / 15" TFT screen / $1799-$2299[3]

e business tools

ers for model 6643/13U. Actual reseller prices may vary. PCs referenced in this ad include an operating system. NetVista and IBM product names are trademarks of International Business Machines Corp. Intel, the Intel Inside logo and

FINALLY,
THE FAVOR IS RETURNED.

intel inside
pentium® !!!

COMPUTERS
CHANGED THE WORLD.

IBM®